Regional Association VI (Europe)

Abridged Final Report of the Seventeenth Session

Geneva

7–9 February 2018

WEATHER CLIMATE WATER

WORLD METEOROLOGICAL ORGANIZATION

WMO-No. 1210

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GENERAL SUMMARY OF THE WORK OF THE SESSION

1. The president of Regional Association VI, Mr Ivan Čačić, opened the seventeenth session of RA VI on 7 February 2018 at 9.30 a.m. in Geneva (WMO headquarters). He recalled that since the last session, the Regional Association has succeeded in establishing working mechanisms and regional and interregional cooperation to support National Meteorological and Hydrological Services (NMHSs) and deliver on regional priorities. In this regard, he expressed appreciation to the Members and the experts for their contribution to advancing WMO priorities regionally. He also underlined progress with the establishment of the WMO Eurasian Office in Minsk, Belarus and WMO Project Office for South-East Europe in Zagreb, Croatia. He also stressed among future priorities the integration of different communities in Multi-hazard Early Warning Systems, the subregional implementation of WIGOS, and the exploitation of advanced European Meteorological Infrastructure.

The Secretary-General, Professor Petteri Taalas, in welcoming the participants drew attention to the increase in extreme weather and climate events over the past year, which requires that the NMHSs play an even more critical role in disaster risk reduction. The Regional Association has the vital task to stimulate and coordinate this process. He acknowledged the progress made by RA VI and its Members since the last session, as well the role and activities of the WMO Regional Offices. He outlined his perspective on the proposed reform of WMO constituent bodies, noting possible options considered by the Executive Council Working Group on WMO Strategic and Operational Planning and the presidents of regional associations and technical commissions and the role of regional associations in providing both policy and technical support.

2. The agenda of the session is provided in Appendix 1.

3. The session adopted 18 Resolutions (given in Appendix 2), 23 Decisions (Appendix 3), and 3 Recommendations (Appendix 4).

4. The Regional Association elected Mr Michael Staudinger (Austria) as president and Ms Kornélia Radics (Hungary) as vice-president of Regional Association VI.

5. The list of participants is given in Appendix 5. Out of a total of 122 participants, 36 were women, i.e. 30%.

6. The Regional Association decided that its eighteenth session would be held in 2021.

7. The seventeenth session of RA VI closed at 1.00 p.m. on 9 February 2018.

APPENDIX 1. AGENDA

1. ORGANIZATION OF THE SESSION

1.1 Opening of the session

1.2 Adoption of the agenda

1.3 Establishment of committees

1.4 Programme of work of the session

1.5 Other organizational matters

1.6 Date and place of the eighteenth session

1.7 Closure of the session

2. REPORTS

2.1 Consolidated summary reports: (i) RA VI president; (ii) chairpersons of the working groups and leader of the Task Team on the Regional Operating Plan; and (iii) WMO Representative for Europe

2.2 Report from the Regional Conference – Summary of recommendations

3. RA VI STRATEGIC PRIORITIES AND EMERGING ISSUES IN WEATHER, CLIMATE AND WATER

3.1 Improving service delivery – Disaster and climate resilience through impact-based decision support services

3.2 Enhancing Earth system observations and information management

3.3 Advancing the Global Data-processing and Forecasting System – Preparing for future technology

3.4 Targeted research in support of services with focus on integrating research and operation

3.5 Narrowing the performance gaps of National Meteorological and Hydrological Services in RA VI (capacity development)

3.6 Partnerships and cooperation

4. WORKING SMARTER – RA VI FUTURE GOVERNANCE

4.1 RA VI inputs to the WMO Strategic and Operating Plans 2020–2023

4.2 Internal matters of the Association

5. ELECTION OF OFFICERS

6. ANY OTHER BUSINESS

APPENDIX 2. RESOLUTIONS ADOPTED BY THE SESSION

Resolution 1 (RA VI-17)

IMPROVING FLOOD EARLY WARNING, INCLUDING FOR FLASH FLOODS

REGIONAL ASSOCIATION VI (EUROPE),

Noting the major flood-related disasters in RA VI in recent years and the general international agreement about the effectiveness in shifting the emphasis from a policy of response to a policy of prevention including the advancement of early warning systems for flooding,

Recalling:

(1) Resolution 10 (RA VI-16) – Regional Association VI Working Group on Climate and Hydrology,

(2) Resolution 21 (Cg-XV) – Strategy for the Enhancement of Cooperation between National Meteorological and National Hydrological Services for Improved Flood Forecasting,

(3) Resolution 15 (Cg-XVI) – Establishment of an Advisory Group for the WMO Flood Forecasting Initiative,

(4) Resolution 18 (Cg-17) – Hydrology and Water Resources Programme,

(5) Resolution 17 (EC-69) – Seamless Data-processing and Forecasting System,

(6) Decision 7 (EC-68) – Flood Forecasting Initiative, which endorses the workplan of the Flood Forecasting Initiative Advisory Group (FFI-AG),

(7) Resolution 6 (CHy-15) – The Flood Forecasting Initiative and the contribution of the Commission for Hydrology to the Disaster Risk Management Programme,

(8) Resolution 10 (CHy-15) – Work programme and structure of the Commission for Hydrology, which includes a number of activities related to flood forecasting,

(9) Decision 5 (EC-69) – Flood forecasting, which endorses the activities of the Commission for Hydrology related to flood forecasting as identified in Resolution 10 (CHy-15),

(10) The reports of the meeting of the RA VI Working Group on Climate and Hydrology, held in Oslo, Norway, on 19 September 2016, and of the third RA VI Hydrology Forum, held in Oslo, Norway, from 21 to 23 September 2016,

Recognizing that the RA VI Regional Operating Plan 2016–2019 included activities that were supportive of the WMO Flood Forecasting Initiative and its objective of improving early warning capability and delivery of flood, flash and urban flood warnings,

Noting further that the Commission for Hydrology (CHy), in its fifteenth session in December 2016, took decisions that might have an impact on RA VI activities related to flood forecasting. These include: (i) adopting the Implementation Strategy for the End-to-End Early Warning Systems (E2E EWS) for flood forecasting (using the community of practice approach) (Resolution 10 (CHy-15), Annex 1, 1.4 (e)), and (ii) working with the WMO/Global Water Partnership Associated Programme on Flood Management on providing guidance and training material on E2E EWS for flood forecasting through the Integrated Flood Management HelpDesk, and preparing guidelines on how to formulate numerical weather prediction information for use in flood forecasting, consistent with the FFI-AG Workplan 2016-2019 (Resolution 10 (CHy-15), Annex 1, 1.4 (e) and (g)),

Acknowledging:

(1) That two components of the Flash Flood Guidance System (FFGS) have been implemented and are currently operational in the Region, notably the South-East Europe FFGS and the Black Sea and Middle East FFGS, allowing the provision of flash flood early warnings covering 16 countries,

(2) That several other initiatives addressing flood forecasting are ongoing in the Region, such as individual Member activities (for example, the *Plateforme Opérationnelle pour la Modélisation* in France), the Flood Forecasting and Warning System for the Sava River Basin, the South-East European Multi-hazard Early Warning Advisory System, and the European Flood Awareness System,

(3) That additional RA VI Members could benefit from the application of the Flash Flood Guidance System and the further development and application of riverine flood forecast systems,

(4) That the FFI-AG Workplan 2016–2019, adopted in December 2015, aims to ensure that guidance material is available for National Meteorological and Hydrological Services and for donors, non-governmental organizations and other organizations working to strengthen flood forecasting capabilities in national services,

Invites Members:

(1) To collaborate with the appropriate RA VI structure in sharing their best practices in flood forecasting and providing contributions to the development of guidance material on how to best communicate probabilistic forecast and uncertainty in forecast products, especially to civil protection and disaster managers;

(2) To maintain their involvement in the continual training of staff on use of the FFGS, in South-East Europe and the Black Sea and Middle East applications, and to perform validation of the FFGS products, assess their impact and provide suggestions on how the FFGS can better respond to emerging needs;

(3) To take steps to ensure closer cooperation between meteorological and hydrological communities, allowing the consequent design and implementation of End-to-End Early Warning Systems for flood forecasting;

(4) To participate and support the development of the CHy Implementation Strategy for the End-to-End Early Warning Systems for flood forecasting (using the community of practice approach);

(5) To strengthen the development and implementation of flood forecasting systems to allow timely and accurate issuance of early warnings;

Decides:

(1) To explore possible ways of cooperation with the European Flood Awareness System and other centres of expertise and partnerships and to develop guidance material on how to best communicate probabilistic forecasts and uncertainty in forecast products (especially to civil protection and disaster managers) as priority themes in hydrology and water resources in the Region;

(2) To collect material on operationally used methodologies to validate forecasts, including ensemble techniques, leading to the development of recommended practices, as suggested by the third RA VI Hydrology Forum in 2016;

(3) To engage its Members in the CHy Implementation Strategy for the End-to-End Early Warning Systems for flood forecasting (using the community of practice approach), exploring possible avenues of cooperation to increase Member capabilities to provide early warning of flooding, in line with the provisions of Resolution 6 (CHy-15);

Requests the Secretary-General, as appropriate and within the available budgetary resources:

(1) To assist RA VI Members in the effort led by the Flood Forecasting Initiative Advisory Group to assess their flood forecasting capabilities by, for example, undertaking an initial pilot application of the developed assessment guidelines;

(2) To promote and support within RA VI the adoption of appropriate technologies and recommended practices and procedures to advance Member capabilities to provide early warning of hydrometeorological hazards.

Resolution 2 (RA VI-17)

DROUGHT ACTIVITIES IN REGIONAL ASSOCIATION VI

REGIONAL ASSOCIATION VI (EUROPE),

Recalling:

(1) Resolution 5 (CHy-14) – Establishment of an Integrated Drought Management Programme,

(2) Resolution 1 (CAgM-16) – Integrated Drought Management Programme,

(3) Decision 44 (EC-69) – Enhancing national and regional drought-monitoring systems,

(4) The RA VI Regional Operating Plan 2016–2019,

Noting:

(1) Agricultural meteorology and drought activities in RA VI (see RA VI-17/INF. 3.1(2)),

(2) The RA VI Regional Operating Plan 2016–2019 Key Outcome 2.3 on improved drought early warning and management systems, and its Key Performance Indicators 2.3.1 "Number of national and regional centres for issuing drought early warnings" and 2.3.2 "Increase in the number of satisfied users of drought early warnings issued by national and regional centres",

(3) Activities of the RA VI Working Group on Climate and Hydrology, the Task Team on Water Scarcity and Drought and the Task Team on Agricultural Meteorology, associated with the implementation of climate-related issues,

(4) Links between the European Meteorological Services Network Meteoalarm and WMO meteo alert systems, the current lack of drought monitoring in these systems and the need to provide timely information on the intensity, geographical extent, duration, evolution and cessation of such extreme climate events which can have disastrous effects on health, agriculture, water and public services,

(5) The establishment of the South-East European Multi-hazard Early Warning Advisory System, funded by the United States Agency for International Development/Office of US Foreign Disaster Assistance,

(6) The need for drought information to be developed as an integral part of the efforts of National Meteorological and Hydrological Services (NMHSs) in providing high-quality, timely climate services in support of climate risk management and disaster risk reduction,

Having considered:

(1) Progress in the WMO/Global Water Partnership Integrated Drought Management Programme (IDMP) and its Regional Integrated Drought Management Programme for Central and Eastern Europe (IDMP CEE),

(2) The establishment of the DriDanube project, which aims to increase the capacity of the Danube region to manage drought-related risks and is implementing drought monitoring and risk assessments in cooperation with NMHSs, river basin authorities, ministries and research institutions,

(3) The continued progress of the Drought Management Centre for South-Eastern Europe (DMCSEE), hosted by the Slovenian Environment Agency,

(4) Progress made in regional drought activities, such as the IDMP CEE and DriDanube project with the collaboration of the European Drought Observatory of the Joint Research Centre, and the role played by DMCSEE in those activities,

(5) The contribution of the RA VI Regional Climate Centre Network and other various RA VI centres in drought monitoring,

Requests the RA VI president to determine which RA VI working bodies would be most appropriate for the task of exploring the possibilities of integrating drought into regional multi-hazard early warning systems, including by building upon existing capabilities of Regional Climate Centres and other organizations;

Requests Members:

(1) To support DMCSEE by exchanging relevant data and information, nominating focal points for technical activities and providing content for regional products, such as the monthly DMCSEE bulletin;

(2) To assist DMCSEE to further operationalize its activities in the countries covered by the Centre and then explore expanding DMCSEE activities to subregional centres in Central Europe and South Caucasus;

Requests the Secretary-General:

(1) To work with DMCSEE to further institutionalize its links and interactions with IDMP and the European Drought Observatory;

(2) To establish an RA VI trust fund to assist Members with regional weather and climate monitoring, training, secondments and regional hazard early warning systems in order to further support regional institutions such as DMCSEE;

Encourages Members to further liaise with IDMP and, if applicable, with IDMP CEE on drought-related issues.

Resolution 3 (RA VI-17)

WMO GLOBAL MULTI-HAZARD ALERT SYSTEM

REGIONAL ASSOCIATION VI (EUROPE),

Recalling:

(1) The WMO Convention (WMO-No. 15), which reaffirms "the vital importance of the mission of the National Meteorological, Hydrometeorological and Hydrological Services in observing and understanding weather and climate and in providing meteorological, hydrological and related services in support of relevant national needs which should include the following areas: (a) protection of life and property, (b) safeguarding the environment, (c) contributing to sustainable development, (d) promoting long-term observation and collection of meteorological, hydrological and climatological data, including related environmental data, (e) promotion of endogenous capacity-building, (f) meeting international commitments, [and] (g) contributing to international cooperation"; which also recognizes that "Members need to work together to coordinate, standardize, improve and encourage efficiencies in the exchange of meteorological, climatological and hydrological and related information between them, in the aid of human activities"; and considers that "meteorology is best coordinated at the international level" and there is a "need for close cooperation with other international organizations",

(2) Resolution 10 (Cg-17) – Sendai Framework for Disaster Risk Reduction 2015–2030 and WMO participation in the International Network for Multi-hazard Early Warning Systems, in which it is noted "that the Sendai Framework calls for the necessity of enhancing multi-hazard early warning systems (MHEWS) and that the Member States of the United Nations called for strengthened regional and international cooperation to develop science-based methodologies and tools to support MHEWS",

(3) The *Abridged Final Report with Resolutions of the Seventeenth World Meteorological Congress* (WMO-No. 1157), general summary, paragraph 3.2.5, in which Congress highlighted global target (g) of the Sendai Framework for Disaster Risk Reduction 2015–2030, which is to "substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people by 2030",

(4) Decision 3 (EC-69) – WMO Global Multi-hazard Alert System, which endorses the Global Multi-hazard Alert System (GMAS) vision as an initial draft statement that is to be further advanced through the guidance of the Executive Council Working Group on Disaster Risk Reduction (EC WG/DRR),

(5) The *Abridged Final Report with Resolutions of the Seventeenth World Meteorological Congress* (WMO-No. 1157), Annex XV, which states that National Meteorological and Hydrological Services are the official authoritative source, and in most countries, a single voice, on weather warnings in their respective countries, and, in many, they are also responsible for climate, hydrology, air quality, seismic and tsunami warnings and for space weather forecasts and warnings,

(6) Decision 5 (EC-68) – Provision of multi-hazard impact-based forecast and risk-based warning services to the public; in which the Executive Council considered that there is a need to make every effort to assist Members to be more responsive to changing societal needs, thus fulfilling their role as an authoritative voice,

(7) Resolution 5 (Cg-17) – Public Weather Services Programme, which requests the Secretary-General to liaise with the Member that hosts the Severe Weather Information Centre website to carry out the enhancement necessary to enable the website to disseminate weather warnings that would be provided in Common Alerting Protocol (CAP) format by Members,

Recognizing:

(1) That early warnings of weather, water and climate hazards have proven to be very effective in reducing loss of life and property,

(2) That impacts related to hydrometeorological hazards affect an increasingly exposed and vulnerable population at the national, regional and global levels, requiring that warning information from all countries be made more easily available for decision-makers within the United Nations humanitarian agencies and economic sectors and for the general public,

(3) That there have been significant advancements in the accuracy, reliability and timeliness of observations, forecasts and warnings of severe weather phenomena,

(4) That the global indicators to measure the success of warnings (that is, those for the global targets of the Sendai Framework) will require coordinated reporting from Members,

(5) That the World Weather Information Service and Severe Weather Information Centre websites serve as good examples, and Hong Kong, China, is willing to enhance these websites to disseminate weather warnings provided in CAP and other equivalent formats by Members,

(6) That regional, subregional and national platforms, such as Meteoalarm of the European Meteorological Services Network and MeteoAlert of the Russian Federal Service for Hydrometeorology and Environmental Monitoring (Roshydromet), the WMO Alert Hub and Google Public Alerts, all serve as good examples that could be leveraged in the development of WMO GMAS,

(7) That Members are the authoritative source for issuing disaster warning products in their respective countries,

Noting:

(1) That the United Nations Secretary-General has recently called for enhanced information for the United Nations Operations and Crisis Centre to support decision-making,

(2) That the United Nations Operations and Crisis Centre will require close coordination with WMO to facilitate and consolidate weather, climate and water information,

(3) That in addition to national early warning systems, further regional/subregional multi-hazard alarm systems and partnerships are being set up by Members: (i) the South-East European Multi-hazard Early Warning Advisory System, which has published its implementation plan and is supported by the United States Agency for International Development and the World Bank, (ii) the pilot project to enhance the capability of meteorological disaster risk reduction in Regional Association II, coordinated by the China Meteorological Administration and the Hong Kong Observatory based on the implementation of CAP, and (iii) the experience of the Hong Kong Observatory in hosting the World Weather Information Service and Severe Weather Information Centre websites of WMO,

Having been informed:

(1) That the EC WG/DRR has established two Global Multi-hazard Alert System task teams to address the policy and technical aspects of GMAS respectively, and that these task teams

met in Geneva from 19 to 20 October 2017 to further advance the GMAS concept and develop a project plan encompassing the key deliverables, namely: (i) a detailed plan aimed at gathering the user requirements of such a system and (ii) the development of a detailed proposal to be presented to the Executive Council at its seventieth session which leverages existing working mechanisms (for example, the Commission for Basic Systems Management Group Task Team on Disaster Risk Reduction, where available) in consultation with regional associations and technical commissions,

(2) That the initial GMAS concept was presented and well received at the Joint Meeting of Presidents of Regional Associations and Presidents of Technical Commissions (9–11 January 2017, Geneva), the sixteenth session of Regional Association II (12–16 February 2017, Abu Dhabi, United Arab Emirates) and the seventeenth session of Regional Association IV (27–31 March 2017, San José, Costa Rica),

Endorses the GMAS vision to be recognized globally by decision-makers as a resource of authoritative warnings and information related to high-impact weather, water, ocean and climate events (as stated in the annex to Decision 3 (EC-69)), as an initial draft statement which will be further advanced through the guidance of EC WG/DRR;

Requests Members, pending the decision on GMAS of the Executive Council at its seventieth session:

(1) To participate and contribute to the development of WMO GMAS;

(2) To identify projects from among the existing regional systems that demonstrate potential in their capabilities and functions for involvement in GMAS;

(3) To identify national practices in multi-hazard early warning systems for use in GMAS;

(4) To formulate their requirements vis-à-vis GMAS;

Requests the Secretary-General to support the EC WG/DRR in incorporating the work already conducted by the Expert Group on WMO GMAS into their own agenda.

Resolution 4 (RA VI-17)

SOUTH-EAST EUROPEAN MULTI-HAZARD EARLY WARNING ADVISORY SYSTEM

REGIONAL ASSOCIATION VI (EUROPE),

Recalling:

(1) Decision 3 (EC-68) – WMO disaster risk reduction governance, user-interface mechanisms and Disaster Risk Reduction Road Map,

(2) Resolution 10 (Cg-17) – Sendai Framework for Disaster Risk Reduction 2015–2030 and WMO participation in the International Network for Multi-hazard Early Warning Systems, in which Seventeenth World Meteorological Congress requested the regional associations to assist with the development of the International Network for Multi-hazard Early Warning Systems and to cooperate with regional bodies and regional organizations to strengthen partnerships and support WMO Regional Centres in order to promote the implementation of the Sendai Framework, in particular multi-hazard early warning systems (MHEWS),

(3) Resolution 5 (EC-67) – Executive Council Working Group on Disaster Risk Reduction, through which the Executive Council established the aforementioned working group,

(4) Resolution 8 (EC-64) – Enhanced capabilities of Members to reduce risks and potential impacts of hazards caused by weather, climate, water and related environmental elements, which endorses the establishment of four disaster risk reduction user-interface expert advisory groups on (i) hazard and risk analysis, (ii) MHEWS, (iii) humanitarian assistance and (iv) climate services for disaster risk financing, listed in the Disaster Risk Reduction Programme Workplan (annex to Resolution 8 (EC-64)),

(5) Decision 3 (EC-69) – WMO Global Multi-hazard Alert System, which points to the South-East European Multi-hazard Early Warning Advisory System (SEE-MHEWS-A) as one of the regional/subregional multi-hazard alarm systems set up by Members that contribute to the development of the WMO Global Multi-hazard Alert System,

Noting that the protection of lives, property and livelihoods is at the core of the priorities of WMO Members and the National Meteorological and Hydrological Services (NMHSs),

Recognizing that WMO initiated the development of SEE-MHEWS-A with initial support from the United States Agency for International Development/Office of US Foreign Disaster Assistance,

Noting also:

(1) That 20 meteorological and hydrological services of South-East Europe contributed to the development of the South-East European Multi-hazard Early Warning Advisory System, while strengthening observations, forecasting and modelling in the region,

(2) The contribution and willingness to collaborate in the development and implementation of the project of several WMO Members outside South-East Europe (including the United Kingdom of Great Britain and Northern Ireland, Finland, Sweden, Netherlands, Czechia, Russian Federation, Austria, Belgium, France, Italy, China, Spain, United States of America, Japan), as well as a number of international organizations and projects, such as the European Centre for Medium-range Weather Forecasts, European Organization for the Exploitation of Meteorological Satellites, European Meteorological Services Network, European Severe Storms Laboratory, European Commission Joint Research Centre, National Oceanic and Atmospheric Administration/National Weather Service, and Japan Meteorological Agency, and other entities, such as the numerical weather prediction consortia ALADIN, COSMO, HIRLAM and SEECOP/NMMB model, Global Flash Flood Guidance System, International Sava River Basin Commission, Drought Management Centre for South-Eastern Europe, South-East European Virtual Climate Change Centre, and Euro-Mediterranean Centre for Climate Change,

Noting further:

(1) That SEE-MHEWS-A is an overarching framework that will support NMHSs in their provision of services to national MHEWS stakeholders,

(2) That SEE-MHEWS-A will provide a new mechanism for improved service delivery through advancements in meteorological, hydrological and marine forecasting, which could be made possible by enhanced modelling capabilities, nowcasting, infrastructure for information and communication technologies, and data provision,

(3) That the SEE-MHEWS-A Implementation Plan was developed as a joint effort between WMO, NMHSs of South-East Europe and numerous collaborators, outlining the framework for the technical implementation of the system, governance structure and necessary activities to make SEE-MHEWS-A operational by mid-2023,

Having considered the importance of such a project in South-East Europe due to the exposure of the region to a range of disasters caused by the impacts of weather- and water-related natural hazards,

Having been informed that further funding for the establishment of SEE-MHEWS-A is expected to be provided by development partners, such as the World Bank, United States Agency for International Development, European Union and Green Climate Fund,

Decides to endorse the SEE-MHEWS-A project and its Implementation Plan for which the concept note and executive summary are provided, respectively, in the annexes to the present resolution;

Requests the president of RA VI and the Management Group to steer further development and implementation of SEE-MHEWS-A in line with the WMO strategic and operational planning process, to contribute to the future development of the WMO Global Multi-hazard Alert System, and to keep the Executive Council abreast of current developments;

Urges Members to support the participation of NMHS representatives from RA VI in the various groups that constitute the WMO disaster risk reduction governance structure at physical and virtual meetings within the available budgetary resources;

Invites relevant international organizations and relevant programmes/projects of the European Commission, as well as other entities and groupings of RA VI, to support SEE-MHEWS-A, as appropriate;

Requests the Secretary-General to support the development and implementation of SEE-MHEWS-A through the WMO Regional Office for Europe and its subregional Project Office for South-East Europe established in Zagreb, Croatia;

Requests RA VI Members to coordinate and mobilize support from international and regional entities, such as development agencies, the European Commission, World Bank and others, to aid NMHSs in RA VI in implementing the project.

Annex 1 to Resolution 4 (RA VI-17)

CONCEPT NOTE FOR THE SOUTH-EAST EUROPEAN MULTI-HAZARD EARLY WARNING ADVISORY SYSTEM

In recent years South-East Europe has experienced a significant number of severe meteorological and hydrological events that have brought heavy precipitation causing floods and landslides, droughts and forest fires, prolonged cold spells, heat waves, severe thunderstorms, and hailstorms. These hazards have had significant impacts in the region, including losses of human lives, damages to properties and infrastructure, and impaired the functioning of key sectors. The Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) suggests that there will be a marked increase in frequency of occurrence of weather and climate extremes in the future, in particular of heat waves, droughts, and heavy precipitation events, which brings the necessity for improved early warning for communities under threat in order to build their resilience. To assist in this process, the World Meteorological Organization (WMO) with the support of the United States Agency for International Development (USAID) initiated in 2016 the implementation of Phase I of the project 'South-East European Multi-hazard Early Warning Advisory System (SEE-MHEWS-A)'. The project builds on the outcomes of a number of disaster risk reduction related projects implemented in the region in recent years that were funded by the EU, UN Agencies, World Bank and number of other international and national organizations.

One of the most important conclusions of the previous activities in the region was the need to strengthen regional cooperation and address gaps in forecasting and warning provision related to hydrological and meteorological hazards at the national and regional level, particularly for transboundary areas. To achieve this, the development of a regional multi-hazard early warning advisory system (MHEWS-A) consisting of information and tools for forecasters at the hydrometeorological services and harmonized national early warning systems is essential. The development of the SEE-MHEWS-A will support the National Meteorological and Hydrological Services (NMHS) in the region in fulfilling their mandate for provision of timely and accurate warnings to limit impacts associated with hazardous weather, climate and hydrological events and to protect the lives and livelihoods of the people.

A goal of SEE-MHEWS-A is to provide operational forecasters with effective and tested tools for forecasting hazardous hydrometeorological events and their possible impacts and thereby increase warning accuracy and relevance to the stakeholders and users. The system will collect, in one virtual platform, existing information, products and tools needed for provision of accurate forecasts and warnings to support informed decision-making related to the hazards by the national authorities. Furthermore, the system is aimed to function as a cooperative platform where forecasters from different countries can jointly work on identification of potential hazards and their impacts, especially in the case of weather events affecting multiple countries.

The overall objectives of the SEE-MHEWS-A project are:

- Strengthened regional cooperation through leveraging of national, regional and global capacities to develop improved hydrometeorological forecasts, advisories and warnings which will contribute to saving lives and reducing economic losses and damage;

- Strengthened national MHEWS systems by making regional and subregional observing, monitoring and forecasting tools and data available to all participating countries and other beneficiaries;

- To implement impact-based forecasts and risk-based warnings capacities that contribute to better informed decision-making by national governments, disaster management authorities, humanitarian agencies, and NGOs;

- Harmonized forecasts and warnings among the NMHSs especially in transboundary areas of the region;

- Increased operational forecasting capabilities of NMHS staff.

USAID will fund the first phase of SEE-MHEWS-A project in 2016–2017, which will be implemented by WMO. This first year of the SEE-MHEWS-A project will be the project development phase during which the commitment to the project by key stakeholders will be established and a comprehensive SEE-MHEWS-A implementation plan developed. The implementation plan will include:

- Definition of the scope, technical requirements and needed resources for the development of SEE-MHEWS-A;

- Precise definition of the geographical coverage of the system and contributing partner agencies;

- Location and requirements of the virtual platform including what tools are to be included;

- Identification of implementation mechanisms;

- Assessment of training needs related to hazard forecasting and provision of warnings;

- Identification of agreements required at the national and regional levels to enable the development and operative functioning of the system;

- A gap analysis of the observations network within the defined area.

The owners of the SEE-MHEWS-A will be the participating hydrometeorological services from South-East Europe who will be encouraged to work with their respective national disaster risk management agencies (DRM) to ensure that warning and advisory products meet their needs for decision-making. The successful establishment of the SEE-MHEWS-A will significantly depend on the commitment of these authorities in the development of the SEE-MHEWS-A and the political will to improve collaboration at the regional level and between and among national authorities. It is therefore a high priority for the SEE-MHEWS-A project to improve warning accuracy, relevance to decision-making and efficient dissemination. Regional cooperation will be advocated during the project implementation to ensure the commitment of all stakeholders to the project achievements during and after the project implementation.

Annex 2 to Resolution 4 (RA VI-17)

SEE-MHEWS-A IMPLEMENTATION PLAN: EXECUTIVE SUMMARY

In 2016, the World Meteorological Organization (WMO) initiated the development of a South-East European Multi-hazard Early Warning Advisory System (SEE-MHEWS-A) with initial support from the United States Agency for International Development (USAID), Office of U.S. Foreign Disaster Assistance (OFDA). The necessity and urgency for such a system is unquestionable in South-East Europe. Fully developed SEE-MHEWS-A system will support the National Meteorological and Hydrological Services (NMHSs) in fulfilling their core function: providing timely and accurate warnings of hazardous weather events in order to reduce loss of lives and other impacts on people, infrastructure and industry.

South-East Europe has experienced a significant number of severe meteorological and hydrological events in recent years. Heavy precipitation has caused floods and landslides. Droughts have increased the incidence of forest fires. People have also suffered under prolonged heat waves and episodes of cold spells. There have been severe thunderstorms and hailstorms. These natural hazards have had significant impacts: human lives have been lost, property and infrastructure damaged, and the functioning of key sectors impaired. In just one year, such hazards caused economic losses of several billion euros. The frequency of hydrometeorological events is expected to increase in the future. Because of this, there is greater demand for improved early warning for communities at risk as well as a need for better community level preparedness in order to improve resilience.

SEE-MHEWS-A will provide operational forecasters with effective tools for forecasting hazardous weather and hydrological events and their possible impacts. This will improve the accuracy of early warnings and ensure early actions to support hazard-related decision-making by national authorities and others. The system will function as a cooperative platform where forecasters from different countries will work together on the identification of potential hazards and their impacts, especially when impending weather hazards may have potential impacts in several countries, including their cross-border areas.

During the inception phase of the SEE-MHEWS-A project in 2016–2017, which was supported by USAID, a detailed Implementation Plan (see RA VI-17/INF. 3.1(4)) was developed that provides guidelines for development of the technical part of the system and for all activities necessary to establish advisory system operations by mid-2023. In addition, the Plan considers the governance structure and other management aspects of the project implementation. The establishment of the system will rely on the availability of resources during the implementation phase, including expert support and engagement by the NMHSs of the region and project

collaborators (such as NMHSs from Europe, United States of America and others, and research and development institutions). Engagement of development partners in the development and implementation is critical for success of the project. The estimated direct cost of the establishment of the operational system is approximately CHF 21 million. The financial support for the second phase of the SEE-MHEWS-A project was approved by the World Bank at the time of writing this executive summary.

This Implementation Plan was developed as a joint effort between WMO, NMHSs of the region, and numerous collaborators, including WMO Regional Specialized Meteorological Centres, research institutions, numerical weather prediction consortia, and European and United States meteorological and/or hydrological services.

Resolution 5 (RA VI-17)

UNIVERSAL UNIQUE IDENTIFIER FOR HIGH-IMPACT EVENTS REGIONAL PILOT TEST

REGIONAL ASSOCIATION VI (EUROPE),

Mindful of Resolution 9 (Cg-17) – Identifiers for cataloguing extreme weather, water and climate events, which calls for the standardization of weather (including space weather), water, climate and other related environmental hazard information, including the development of identifiers for cataloguing extreme weather, water and climate events,

Noting:

(1) That an approach involving a standard typology of high-impact event types and the assignment of a Universal Unique Identifier (UUID) was proposed by the International Workshop on Cataloguing and Managing Information on Extreme Weather, Water and Climate Events, held in Geneva from 20 to 23 November 2017 (see RA VI-17/INF. 3.1(5)),

(2) That the workshop participants also agreed that this approach should be tested and the results should be communicated to the Executive Council and Congress to seek guidance on the adoption of the approach and a decision on further steps,

Noting further that the approach was endorsed by the Inter-programme Task Team on Cataloguing Extreme Weather, Water and Climate Events, which is part of the Executive Council Working Group on Disaster Risk Reduction,

Recognizing the importance for Members to be involved in the testing of the approach based on their national and regional infrastructures,

Decides to test the proposed approach for cataloguing high-impact events – involving a standard typology of high-impact event types and the assignment of a UUID – as a means of tracking the events and enabling them to be systematically linked to associated data on loss and damage such as is being routinely collected by relevant national authorities, and that the test phase should start in 2018 and continue over a sufficient period to deliver results and recommendations relevant for operationalization of the approach to the Executive Council at its seventieth session in 2018 and to Eighteenth World Meteorological Congress in 2019;

Requests the RA VI Regional Climate Centre Network to consider testing the UUID on high-impact events, such as storms and associated extreme precipitation, wind, snow, hail and cold events; summer heatwaves; floods; droughts and others;

Requests Members of Regional Association VI to participate in the test phase on a voluntary basis;

Requests the Secretary-General to provide the necessary support for conducting the test phase, and to facilitate the expert work for delivering conclusions and recommendations, such as for fine-tuning the approach and understanding its implications for coordination and operationalization;

Invites regional institutions such as the European Centre for Medium-range Weather Forecasts, European Commission Joint Research Centre and European Climate Assessment and Dataset initiative to assist in providing needed data, analysis and forecasts as required for testing UUID over Europe.

Resolution 6 (RA VI-17)

REGIONAL WIGOS IMPLEMENTATION PLAN 2018–2021

REGIONAL ASSOCIATION VI (EUROPE),

Recalling:

(1) Resolution 4 (RA VI-16) – Regional WIGOS Implementation Plan for Regional Association VI (Europe),

(2) Resolution 23 (Cg-17) – Pre-operational phase of the WMO Integrated Global Observing System,

(3) Resolution 69 (Cg-17) – WMO Strategic Plan 2016–2019,

(4) Resolution 2 (EC-68) – Plan for the WMO Integrated Global Observing System pre-operational phase 2016–2019,

Noting:

(1) That the WMO Integrated Global Observing System (WIGOS), as a foundational element supporting all WMO priorities, can assist in improving the integrated operations of Members and in building productive partnerships that will help enhance weather, climate, water and relevant environmental services,

(2) The critical role of WIGOS for the implementation of the Global Framework for Climate Services, weather and disaster risk reduction services, aviation meteorological services, polar and high-mountain regions, and capacity development,

Adopts the updated Regional WIGOS Implementation Plan 2018–2021, as contained in the annex to the present resolution;

Requests the Management Group:

(1) To regularly review WIGOS implementation efforts in the Region;

(2) To oversee, guide and prioritize the activities listed in the Plan, monitor the implementation progress and submit updates to the Plan to the RA VI president for approval;

(3) To facilitate and coordinate regional WIGOS projects;

(4) To coordinate with RA VI Members on the implementation of the Plan, consult with the appropriate technical commissions on technical aspects of the implementation and ensure Members are kept informed;

(5) To provide support to Members in accordance with the Plan and in response to their requests (subject to availability of resources and funds);

(6) To oversee the establishment of the Regional Basic Observing Network in Regional Association VI;

(7) To oversee the work of pilot Regional WIGOS Centres when established;

(8) To support training on the Observing Systems Capability Analysis and Review tool (OSCAR)/Surface as a matter of great urgency;

Requests Members:

(1) To organize their activities so as to realize WIGOS goals and associated outcomes as described in the Plan;

(2) To continue to provide resources, including through the WIGOS Trust Fund and/or seconded experts, to help support the implementation of WIGOS in the Region;

(3) To support the establishment of Regional WIGOS Centres;

(4) To communicate and promote the benefits of WIGOS nationally;

(5) To actively promote the national implementation of WIGOS as a means to contribute to Earth systems observations;

(6) To share experiences and lessons learned from the implementation of WIGOS and WIGOS-related documentation with other Members in the Region;

(7) To nominate their national WIGOS and OSCAR/Surface focal points if they have not already done so;

(8) To provide WIGOS implementation progress reports at the request of the RA VI Management Group;

Requests the national WIGOS and OSCAR/Surface focal points to actively support the integration of partner observing networks and stations in WIGOS, such as those contributing to the observing component of the Global Cryosphere Watch;

Requests the Secretary-General to provide the necessary assistance and Secretariat support for the implementation of WIGOS by RA VI;

Invites partners to participate in relevant implementation activities as specified in the Plan.

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Note: This resolution replaces Resolution 4 (RA VI-16), which is no longer in force.

Annex to Resolution 6 (RA VI-17)

REGIONAL WIGOS IMPLEMENTATION PLAN 2018–2021

WORLD METEOROLOGICAL ORGANIZATION

WMO INTEGRATED GLOBAL OBSERVING SYSTEM (WIGOS)

REGIONAL WIGOS IMPLEMENTATION PLAN FOR REGIONAL ASSOCIATION VI (EUROPE)

(R-WIP-VI)

Version 1.2.1

(30/11/2017)

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REGIONAL WIGOS IMPLEMENTATION PLAN FOR REGIONAL ASSOCIATION VI (EUROPE)

1. INTRODUCTION AND BACKGROUND

1.1 Purpose of WIGOS and scope of the Regional WIGOS Implementation Plan for Regional Association VI (R-WIP-VI)

The WMO Integrated Global Observing System (WIGOS) provides a framework for WMO observing systems, including the contributions of WMO to co-sponsored observing systems. It is important to recognize that WIGOS is not replacing the existing observing systems, but is rather an overarching framework for the evolution of these systems which will continue to be owned and operated by a diverse array of organizations and programmes. WIGOS focuses on the integration of governance and management functions, mechanisms and activities to be accomplished by contributing observing systems, according to the resources allocated on a global, regional and national level.

This Plan is laid out in several chapters that identify and describe the various activity areas to be addressed within this Region. Specific regional/national activities for each area are included in Table 2 (see Chapter 4), which identifies deliverables, timelines, responsibilities, risks, and whether the activity requires regional and/or national implementation. Similar activities are grouped under the title corresponding to the respective sections of Chapter 2.

1.2 WIGOS vision and Congress guidance for WIGOS implementation

The Seventeenth World Meteorological Congress (Cg-17) decided that the development of WIGOS, supported by WIS, as one of the WMO strategic priorities for 2016–2019[1], will continue during its pre-operational phase building upon and adding to those key building blocks of the WIGOS Framework that have already been implemented, while gradually shifting the emphasis from the global level toward implementation activities at the regional and national levels. The goal is to have Members and their partners benefit from a fully operational system from 2020 onward.

The highest priorities for the WIGOS Pre-operational Phase are: (1) National WIGOS implementation; (2) WIGOS Regulatory Material complemented with necessary guidance material to assist Members with the implementation of the WIGOS technical regulations; (3) Further development of the WIGOS Information Resource (WIR), with special emphasis on the operational deployment of the Observing Systems Capability Analysis and Review (OSCAR) databases; (4) Development and implementation of the WIGOS Data Quality Monitoring System; and (5) Concept development and initial establishment of Regional WIGOS Centres (RWCs).

Basic functions of the RWC will be regional coordination, guidance, oversight and support of WIGOS implementation and operational activities at the regional and national levels (day-to-day level of activities).

The Plan for the WIGOS Pre-operational Phase (PWPP) adopted by EC-68 guides the development of WIGOS over the coming four years, especially at the regional and national levels, and assists in defining priorities and targets.

Based on PWPP, R-WIP-VI has been reviewed and updated considering the regional activities, needs, requirements and priorities.

2. KEY ACTIVITY AREAS FOR REGIONAL WIGOS IMPLEMENTATION

The component observing systems of WIGOS comprise the Global Observing System (GOS), the observing component of the Global Atmosphere Watch (GAW), the WMO Hydrological

[1] See the WMO Strategic Plan (http://library.wmo.int/pmb_ged/wmo_1161_en.pdf)

Observing Systems (WHOS) (including WHYCOS) and the observing component of the Global Cryosphere Watch (GCW), including surface- and space-based components). The above component systems include all WMO contributions to the cosponsored systems, i.e. GCOS, GOOS and GTOS, as well as the WMO contributions to GFCS and GEOSS.

To migrate the existing observing systems into the more integrated single system that is WIGOS, focused effort is required at the regional level in the following key areas, detailed in the respective sections:

(a) Management of WIGOS implementation in Regional Association VI;

(b) Collaboration with WMO co-sponsored observing systems and international partner organizations and programmes;

(c) Design, planning and optimized evolution of WIGOS component observing systems;

(d) Observing system operation and maintenance;

(e) Quality management;

(f) Standardization and interoperability;

(g) WIGOS Information Resource;

(h) Data discovery and availability (data and metadata);

(i) Capacity development;

(j) Communications and outreach.

2.1 Management of WIGOS implementation in RA VI

WIGOS implementation is an integrating activity for all regional components of WMO and co-sponsored observing systems: it supports all WMO Programmes and activities.

Executive Council

The WMO Executive Council will continue to monitor, guide, evaluate and support the overall implementation of WIGOS. Following guidance from Sixteenth Congress, the sixty-third session of the Executive Council established the Inter-Commission Coordination Group on WIGOS (ICG-WIGOS) with a view to providing technical guidance and assistance for the planning, implementation and further development of the WIGOS component observing systems. Progress in implementing WIGOS will be reported on to subsequent sessions of the Executive Council. The Council designated the president of CBS as chair of ICG-WIGOS.

Regional Association VI

Regional Association VI plays the key role in WIGOS implementation in the Region. Through its corresponding Working Group (WG), it will coordinate the planning and implementation of WIGOS at the regional level taking into account all WMO future priorities, such as GFCS and DRR. Under the guidance of ICG-WIGOS and with the support, where required, of the WIGOS Project Office (WIGOS-PO) and Regional Office for Europe in the WMO Secretariat, a corresponding WG will be responsible for:

(a) The further development of the Regional WIGOS Implementation Plan;

(b) The integration of WIGOS regional network components;

(c) The contribution to WIGOS regulatory material;

(d) The development of the regional WIGOS Data Quality Monitoring System;

(e) The support and assistance in using the OSCAR;

(f) The assistance in establishing and operation of Regional WIGOS Centres;

(g) The coordination of capacity development activities in the Region; and

(h) The evolution of their regional networks according to the implementation plan for the evolution of global observing systems (EGOS-IP)[2].

R-WIP also addresses regional aspects of requirements, standardization, observing system interoperability, data compatibility, data and metadata management, quality management system procedures, including performance monitoring and data-quality monitoring, and proposed improvements in observing networks/systems. An important role of the Regional Association will be to assess and continuously monitor regional requirements, identify regional gaps and capacity development projects within the Region to address those gaps.

Members of the Region

Building on WIP and R-WIP, Members are requested to develop a National WIGOS Implementation Plan (N-WIP) to help them plan, implement, operate and maintain national networks and observing programmes based on the standard and recommended practices and procedures stated in the WMO Technical Regulations. They will be encouraged to adopt a composite network approach and to include the acquisition and onward transmission of data from external sources, including NMHSs and other government agencies, the commercial sector and members of the public. A particular area of focus for Members of the Region will be increased attention to protection of observing sites and radio frequency spectrum.

Plans should also be developed to strengthen cooperation through partnership with different owners overseeing the WIGOS component observing systems within their countries. Specifically, these activities aim to enhance cooperation amongst meteorological, hydrological, marine/oceanographic and academic/research institutions/services where they are separated at the national level.

Concerning radio-frequency spectrum protection, Members should maintain close coordination with their national authorities to register their frequencies for adequate protection, and to defend the availability of frequencies for Meteorology, Climatology and Earth observations, influencing positively the national delegations to the World Radiocommunication Conferences.

2.2 Collaboration with WMO co-sponsored observing systems and international partner organizations and programmes

WIGOS is an integrated, comprehensive, and coordinated system primarily comprising the surface- and space-based observing components of GOS, GAW, GCW, and the WMO Hydrological Observing System (including WHYCOS) and including all WMO contributions to GCOS, GOOS and GTOS. It should be noted that in contrast with the primarily NMHS-owned observing systems upon which the World Weather Watch (WWW) was built, the proposed WIGOS component observing systems are owned and operated by a diverse array of organizations, both research and operational. The interaction of these various communities at the regional and national levels is therefore important for the implementation of WIGOS within the Region. In particular, strengthening the interaction of research and operational observing communities is important for sustaining and evolving observing systems and practices, in line with new science and technology outcomes. WIGOS is a major observing component of GFCS and also provides indispensable contributions to GEOSS.

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[2] http://www.wmo.int/pages/prog/www/OSY/gos-vision.html#egos-ip.

Partner organizations and programmes

At the regional level, coordination and cooperation is supported by a mechanism to be defined by the Regional Association and the respective regional bodies, such as the Network of European Meteorological Services (EUMETNET)[3], the Interstate Council on Hydrometeorology of the Countries of the Commonwealth of Independent States (ICH/CIS), the European Organization for the Exploitation of Meteorological Satellites (EUMETSAT), the European Centre for Medium- Range Weather Forecasts (ECMWF) and relevant European Union bodies in order to resolve possible problems in data policy, product delivery and other governance issues. This inter-agency and inter-observing system coordination mechanism is need to be complemented and supported through similar cooperation and coordination arrangements among NMHSs and through national implementation mechanisms for GFCS, GCOS, GOOS, GTOS and GEOSS.

The Architecture for Climate Monitoring from Space has been defined as an end-to-end system, involving the different stakeholders including operational satellite operators and research and development space agencies, the Coordination Group for Meteorological Satellites (CGMS), the Committee on Earth Observation Satellites, GCOS, the World Climate Research Programme and the Group on Earth Observations (GEO). Within the Regional context, the Architecture shall be part of the space-based component of WIGOS. Particular emphasis is therefore be placed on their coordinated contribution to WIGOS within the Region, building on existing coordination mechanisms stated above.

2.3 Design, planning and optimized evolution of WIGOS component observing systems

WMO has agreed on the Vision for the Global Observing Systems in 2025[4], which provides high-level goals to guide the evolution of the global observing systems during the coming decades. To complement and respond to this Vision, an EGOS-IP was approved by CBS-15 (September 2012) for consideration by the sixty-fifth session of the Executive Council (May 2013). EGOS-IP focuses on the long-term evolution of WIGOS component observing systems, while WIP focuses on the integration of these component observing systems. Beyond 2015 these plans provide Members of the Region with clear and focused guidelines, specifying actions that stimulate the cost-effective evolution of the observing systems to address the requirements of all WMO Programmes and relevant parts of co-sponsored programmes in an integrated manner.

Concerning the surface-based subsystem of WIGOS, the current composition of mainly separate networks of observing stations comprises numerous different types of sites. With the implementation of WIGOS, these separate networks will continue to evolve but will also be given a more prominent collective identity as the WIGOS surface-based subsystem and for some purposes may be considered as a single composite system of observing (fixed or mobile) sites/platforms. The Regional Association will adopt a broader role in coordinating the implementation of relevant elements of the WIGOS surface-based subsystem, evolving from the previous concepts of mainly regional synoptic and climatological networks into an integrated concept of a WIGOS Regional Network.

Similarly, the space-based subsystem of WIGOS is composed of many different platforms and types of satellites. There is already partial integration due to the existence of a globally coordinated plan, which is maintained by WMO and CGMS, and which takes into account the needs of a number of application areas. However, it should be further developed and expanded to better support certain application areas that, at present, are not benefiting from the full potential of space-based observations, such as other components of GAW and the WHOS and new initiatives such as GFCS and GCW. In addition, further integration shall be pursued in terms of intercalibration, data and product harmonization and composite product delivery. The Regional Association will adopt an active role in compiling the views of Members and

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[3] A grouping of 29 European National Meteorological Services that provides a framework to organize cooperative programmes between its Members in the various fields of basic meteorological activities.

[4] Available from the WMO Website at: http://www.wmo.int/pages/prog/www/OSY/gos-vision.html

maintaining documented requirements and priorities for data and products to be available for the Region from the WIGOS space-based subsystem.

Rolling Review of Requirements (RRR)[5]

Coordinated strategic planning at all levels is based on the RRR process, and is supported by WIGOS regulatory material. This activity has been carried out primarily at the **global level** under the guidance of the ICG-WIGOS.

The RRR process involves a regular view of the observational data requirements[6] for each of the defined WMO Application Areas and all required variables (see Table 1). The RRR process also involves reviewing the capabilities of WMO observing systems and co-sponsored systems, and the details of the networks/platforms in existence[7], for both space- and surface-based systems, in delivering data on different variables. The comprehensive information collected for the globe on both requirements and capabilities is quantitatively recorded in a database accessible through the Observing Systems Capability Analysis and Review tool (OSCAR[8]) of WIR (see section 2.7 below). The information on surface-based networks and instrumentation details formerly recorded in *Weather Reporting* (WMO-No. 9), Volume A, is available, with additional metadata, through OSCAR/Surface. Space-based capabilities are also recorded and made available through OSCAR. OSCAR allows gap analyses to be performed, which identify weaknesses in existing observing programmes.

The above steps represent the analysis phase of the RRR, which is as objective as possible. Next is the prioritization and planning phase, in which experts from the various application areas interpret the gaps identified, draw conclusions and identify key issues and priorities for action. This input is composed of Statements of Guidance (SoG) from each application area. The technical commissions respond to the SoG by formulating new global observing system requirements and the regulatory and guidance publications to assist Members in addressing the new requirements. Additionally, CBS and other technical commissions draw on the SoGs to develop a Vision and an Implementation Plan for further developments of WIGOS.

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5 Currently specified in the *Manual on the Global Observing System* (WMO-No. 544), elaborated in the *Guide to the Global Observing System* (WMO-No. 488), and described further on the WMO Website at http://www.wmo.int/pages/prog/www/OSY/GOS-RRR.html

6 The RRR describes data requirements, which are expressed in terms of space/time resolution, uncertainty, timeliness, etc., for each of the required observed variables, and are measures independent of observing technology.

7 Capabilities are derived from the individual platforms characteristics submitted by Members to WMO e.g. through OSCAR/Surface

8 The following components are currently available via the WMO website: User Requirements: http://www.wmo.int/pages/prog/www/OSY/RRR-DB.html; and Space-based capabilities: http://www.wmo.int/pages/prog/sat/gos-dossier_en.php. The surface-based capabilities part is currently under development

Table 1: The 14 WMO application areas

No	Application area	No	Application area
1	Global Numerical Weather Prediction	8	Providing Atmospheric Composition information to support services in urban and populated areas
2	High-Resolution Numerical Weather Prediction	9	Ocean Applications
3	Nowcasting and Very Short-Range Forecasting	10	Agricultural Meteorology
4	Sub-seasonal to longer predictions	11	Hydrology[9]
5	Aeronautical Meteorology	12	Climate Monitoring
6	Forecasting Atmospheric Composition	13	Climate Applications
7	Monitoring Atmospheric Composition	14	Space Weather

At the regional level

Although the primary coordination of RRR lies with CBS for overall WIGOS planning, the RA VI, through WG-TDI, will follow the technical guidance of the technical commissions as represented in EGOS-IP and other observing system implementation plans in order to develop and implement observing systems in the Region.

RA VI will examine, and report back to CBS on, its requirements for data and any issues it identifies with the global WIGOS design, taking into account the particular requirements of the Region and international river basin authorities. This process will involve, in essence: (a) the use of global data to prepare Regional data requirements, (b) use of these for detailed planning of WIGOS component observing system at the regional scale; and (c) encouragement of Members of the Region to implement these components, subject to further review at the national or subregional level, where appropriate.

At the national or subregional Level

Members of RA VI will contribute to the collective Regional effort to: (a) assess the Regional data requirements and plan the Regional observing system components; and (b) implement and develop observing systems following this plan, EGOS-IP and other observing system implementation plans. It is expected that Members of the Region prepare their national WIGOS implementation plans (N-WIP) in accordance with R-WIP-VI by considering their national requirements for the observing systems.

Members of the Region will also have available the information on global and regional data requirements available to use as guidance for the preparation of national requirements that can then be used to assist with the detailed planning for evolution of national WIGOS component observing systems.

In some cases, where countries are small and geographically close or already have established multilateral working relationships, there may be more merit in taking a subregional, as opposed to a national, approach to WIGOS observing infrastructure planning. In this case, it

[9] Hydrological information only; water quality monitoring and information is currently excluded.

will be necessary for the Members concerned to work in close cooperation to prepare subregional reviews of requirements to be used as a basis for detailed planning at that scale.

2.4 Observing system operation and maintenance

Observing system owners or custodians are responsible for operating and maintaining their systems and for complying with the regulations of WMO and co-sponsored observing systems to which they contribute. System owners are generally NMHSs or other organizations within WMO Member countries but are sometimes other entities.

On the regional level, WIGOS involves a process for sharing operational experiences, ideas and best practices, expertise and for pooling resources for joint activities, such as is done within EUMETNET. The benefit is to realize synergies and greater efficiencies. These interactions may be between different teams within a single organization (such as an NMHS) or between Regional organizations. These may benefit from technical guidance from relevant technical commissions and, while occurring primarily at a national level, there is a Regional role to be played. Within Regional Association VI, the following regional activities will be important:

(a) WIGOS metadata creation and handling;

(b) Quality monitoring;

(c) Integration of networks – redesign of the Regional Basic Observing Network (RBON);

(d) Establishment of Regional WIGOS Centres;

(e) Establishment of subregional radar networks for exchanging radar data;

(f) Supporting the disaster risk reduction initiatives by establishing required observing systems;

(g) Compilation and publication of national good practices;

(h) Capacity development focused on the provision of data to GFCS, early warning system, and provision of other specialized services, such as marine services.

2.5 Quality management

The Region recognizes that meeting the quality requirements and expectations of users is critical to the success of WIGOS. This requires an in-depth examination of current practices used by WMO observing programmes, specific mission-related requirements that are already in place, and available technological opportunities. WIGOS Quality Management will specify all processes for WIGOS component observing systems including guidance on its effective management.

The WIGOS quality-management approach is consistent with the framework of ISO 9001:2015 – Quality management systems – Requirements (see *Technical Regulation* (WMO-No. 49), Volume I).

In this context, RA VI will give attention to:

(a) The examination of current quality management practices being used in the Region;

(b) The documentation of the quality of observations from the WIGOS Regional networks at all stages of data processing;

(c) Ensuring, where possible, traceability of observations to the International System of Units.

In coordination and collaboration with WMO, CGMS supports the development of quality assurance standards and formats for satellite observations, multi-satellite and multi-sensor algorithms for estimating retrieved data and products, and advanced atmospheric sounding derivation packages for use by WMO Members. To assist this effort, the RA VI will ensure that surface-based sites needed for calibration/validation of satellite data are specified.

A key aspect of regional WIGOS quality management that requires particular attention is systematic and rigorous performance monitoring and evaluation (PM&E) of WIGOS capabilities, in terms of both (a) the flow of observational data/products to models; and (b) provision of products/ information for decision-support tools and services in accordance with requirements specified by end users. Effective PM&E can improve the overall performance of WIGOS and its ability to interact effectively with its user community and meet community needs and requirements.

The key priority will be the development of a modern and efficient data quality monitoring system. This is essential for measuring the effectiveness and impact of WIGOS and it will lead to improved WIGOS data quality and availability.

The plan is to put in place mechanisms and regional structures to handle incident management actions and support Members in improving the data availability and quality by 2018 (dependent on establishment of RWCs).

2.6 Standardization and interoperability[10]

A key area for WIGOS standardization relates to instruments and methods of observation. Standardization of observations is required to achieve system interoperability (including data compatibility) across all WIGOS component observing systems and these are key to turning observations into effective data/products that meet real needs of all Members.

WIGOS standardization should build on existing WMO and other international standards and best practices, and take into account the ongoing rapid progress in technology that will continue to provide a basis for further improvements in the capability, reliability, quality and cost-effectiveness of observations.

System interoperability and data compatibility also rely on the use of standardized data representation and formats, standardized methods for information exchange, and standardization in data management. The first two lie in the WIS domain and the third is a natural extension of WIS responsibilities. It is important that WIGOS and WIS implementation activities are closely coordinated in this respect, and that WMO agrees on an approach to standardizing data management across Programmes.

All WIGOS related standard and recommended practices and procedures are documented in the *Technical Regulations* (WMO-No. 49), its Annex VIII, the *Manual on WMO Integrated Global Observing System* (WMO-No. 1160) and other relevant Manuals.

RA VI will support all activities leading to the interoperability of WIGOS component observing systems (including data compatibility) through utilization and application of the same, internationally accepted standard and recommended practices and procedures (i.e. standardization). Data compatibility will also be supported through the use of standardized data representation and formats.

2.7 WIGOS Information Resource

Accessible via a centralized point (web portal), WIR will provide access to all WIGOS-related operational information, including observational user requirements, a description of the contributing observing networks (instrument/site/platform metadata), and their capabilities, a list of standard and recommended practices and procedures used in the WIGOS framework,

[10] Interoperability is a property referring to the ability of diverse systems to work together (interoperate)

applicable data policies applicable, and information on how to access data. It will also provide general information on WIGOS benefits, and impacts on Members. It will be a tool for conducting critical reviews as part of RRR and can assist Members and the Regional Association in conducting observing network design studies as appropriate. It will provide guidance on how to develop capacities in developing countries according to WIGOS requirements, and will provide Members of the Region with a toolbox to be used nationally if and when required. The information collected is intended, in particular, to identify the gaps in the observing networks, areas where existing observing systems could be used, or where their scope could be expanded at limited cost to address the requirements of more application areas. The information provided on standard and recommended practices and procedures will support the production of more homogeneous datasets and make the observations traceable and of known quality.

The key support tools of WIGOS are: (a) a central web portal (WIGOS-Portal); (b) The WIGOS Standardization of Observations Reference Tool (SORT); (c) OSCAR; and (d) WMO Radar Database (WRD) which includes information on observational user requirements and observing systems capabilities and allows a critical review by comparing the two (see WIP for more information on each of these tools).

The central piece of the WIR is a living, robust, modern, electronic inventory of all observing assets within WIGOS, including all relevant metadata and vocabularies. No meaningful network design activities, gap mitigation or resource optimization can take place without such an inventory. Accordingly, the development, operational deployment and operational uptake of OSCAR/Surface is assigned very high priority for WIGOS in the WIGOS pre-operational.

Subsequent development of the WIR will address the migration and further development of the OSCAR/Space and OSCAR/Requirement, the development of the Gap Analysis Module, OSCAR/Analysis, and the development of the Standardization of Observations Reference Tool (SORT), and the WIGOS Web Portal.

On the other hand, the web based platform developed for collecting, archiving and presenting the metadata of the operational weather radars, WRD, will be integrated to OSCAR/Surface.

Understanding that sources of the individual components of WIR rely on the inputs from its Members, RA VI is committed to provide regular inputs to keep the information resource up to date.

2.8 Data discovery and availability (data and metadata)

Within the WIGOS framework, WIS provides exchange of data and interpretation metadata, and management of related discovery metadata. The later play an important role in the discovery, access and retrieval of WIGOS observations and products by the entire WMO community.

Submission, management and archival of the data and metadata themselves are generally the responsibility of observing system owners/data custodians. However, several World Data Centres and a number of regional or specialized data centres collect, manage and archive basic observational data that are relevant to WMO application areas. Members of RA VI are responsible for submitting their data to these regional or specialized data centres. The Regional Association will encourage its Members to abide by this commitment.

Members of RA VI will adopt WIGOS and WIS standards and make their data and metadata available through WIS for delivery or for discovery, access and retrieval services. In this regard, promotion and implementation of Data Collection and Production Centres (DCPCs) as well as National Centres will be supported and encouraged by the Regional Association. Guidance will be developed and provided through the appropriate WIGOS regulatory and technical documents.

2.9 Capacity development

A coordinated capacity-development effort at global, regional and national levels is of paramount importance to developing countries in the implementation of WIGOS. This is especially the case for the NMHSs of Least Developed Countries (LDCs) and Small Island Developing States (SIDS), to enable them to develop, improve and sustain national WIGOS component observing systems. This needs to be complemented by capacity development efforts outside of WIGOS but in closely related areas to improve access to and effective utilization of observations, data and products and related technologies. WIGOS capacity development activities at the Regional level are focused on:

(a) Providing assistance to Members of the Region to introduce or improve institutional mandates and policies that enable effective implementation, operation and management of observing systems;

(b) Filling the existing gaps in the design, operation and maintenance of WIGOS observing systems, including both infrastructure and human capacity development;

(c) Providing guidance for the inclusion of metadata to OSCAR/Surface and efficient use of OSCAR/Surface, and WRD as well;

(d) Organizing training courses on observing systems, in collaboration with WMO Secretariat;

(e) Technological innovation, technology transfer, technical assistance and decision support tools.

Capacity development in satellite applications for developing countries, LDCs and SIDS are also addressed in EGOS-IP (see WMO/TD-No. 1267). The virtual laboratory will continue to grow and help all WMO Members realize the benefits of satellite data.

2.10 Communications and outreach

RA VI is establishing its communications and outreach strategy through the efforts of WMO Members, programmes, other regional associations (RAs) and technical commissions (TCs), and co- sponsors. The strategy will provide details on WIGOS benefits, increased effectiveness, and efficiency, and impact on the activities of the Members of the Region, as well as on the socio-economic benefits of WIGOS data. It will take advantage of outreach programmes developed and effectively deployed by WMO and its partner organizations within the Region.

The WIGOS portal provides convenient access to relevant information on regional communications, outreach and capacity development, aimed at complementing, not duplicating, others' efforts. A variety of outreach materials are being developed to educate Members, funding agencies, policy-makers and the general public about the importance of WIGOS to society. Materials will include posters and other educational material for elementary and high-school classes, a WIGOS brochure, a semi-annual or annual newsletter, an online photo and video library, and information on the current state of the observing systems.

A regular communication mechanism with WIGOS, OSCAR and WRD focal points, relevant regional working groups and task teams is being established and maintained for the implementation and monitoring of WIGOS at a national level.

3. REGIONAL PROJECT MANAGEMENT

3.1 Regional structures

RA VI is responsible for the Project through a corresponding WG with support from the Regional Office for Europe. Members of the Region are requested to provide support to the Regional Office through secondments.

3.2 Monitoring, review and reporting mechanism

(a) RA VI, through its Management Group (MG), monitor, review, guide and support the overall implementation of WIGOS in the Region, and update the Implementation Plan if and when necessary;

(b) RA VI, through the chair of WG-TDI, will report to ICG-WIGOS and WIGOS-PO on the progress in implementation of WIGOS in the Region;

(c) The President of RA VI will report on WIGOS implementation to the RA's sessions.

3.3 Evaluation

The evaluation methodology is designed against WIGOS implementation activity tables, i.e. with respect to the activities, deliverables, timeline, responsibility and budget allocations. This includes a schedule of monitoring and evaluation activities and related responsibilities. Mid-term evaluation, interim progress reports and post-implementation reviews are planned as a means of providing early feedback on progress towards success and as a means of meeting accountability and transparency requirements for the whole implementation phase. Members will provide progress reports at the request of RA VI Management Group.

4. Implementation

Activities, deliverables, milestones and risks

Table 2 presents the key implementation activities that are required for Regional WIGOS implementation within the timeframe 2018–2021. The table is arranged to correspond to the activity areas presented in Chapter 2. In the table each implementation activity is presented together with its associated deliverables, timelines, responsibilities, costs and risk.

For each activity in Table 2, a detailed activity plan will be developed by the responsible entity or entities, with support of a corresponding WG that will have responsibility for tracking execution of these activities and the plan itself.

5. Resources

The both, human and financial resources are needed at the regional level for the implementation of many of the activities identified. As WIGOS will ultimately be implemented at the national level, the Members need to use their own resources as much as possible.

6. Risk Assessment / Management

The Risk Management Plan (RMP) is being developed for each implementation activity/project, including risk mitigation. The following risk areas have been identified:

(a) Limited Human Capacity within the NMHS and the Secretariat;

(b) Lack of financial resources required;

(c) Insufficient ability of partner organizations to participate;

(d) Inability of Members to fully participate;

(e) Insufficient Members awareness of WIGOS benefits to the Region, subregions and Members;

(f) Lack of cooperation and collaboration with key partners and stakeholders

(g) Fail in timeliness of guidance material.

Table 2: WIGOS Implementation Activities in RA VI

Note: Table 2. "WIGOS implementation activities" of the annex to Resolution 4 (RA VI-16) is completely replaced by a new version.

No.	Activity	Deliverables	Timeline	Responsibility	Potential risks
1. Management of WIGOS implementation in Regional Association VI					
1.1	Regularly update R-WIP-VI	R-WIP-VI updated	2019 onwards	RA-VI MG WG,	Low
1.2	Maintain close links to relevant TCs and ICG-WIGOS to capture and react to evolving plans.	Updated R-WIP-VI	Continuing	RA-VI MG; WG RA VI representatives in TCs	Low/Medium
1.3	Assist Members to develop and implement N-WIPs	N-WIPs developed	2018 onwards	Members WG WIGOS-PO	Medium
1.4	Initiate the process for the establishment of RWC(s) addressing requirements in the subregion(s)	RWC(s) established	2018 onwards	RA-VI MG , ROE	Medium
1.5	Assess the capabilities of RWC(s) to meet requirements	Assessment report	Upon successful completion of the Pilot phase	RA-VI MG	Medium
2. Collaboration with WMO co-sponsored observing systems and international partner organizations and programmes					
2.1	Enhance collaboration with international partners in the collection of observations on a regional scale. Define mechanisms and practices as needed.	Increased number of collaborating partners at a regional level and increased collection of observations.	Continuing	RA-VI MG WG, ROE	Low
2.2	Cooperate with subregional and national organizations to provide observations required for the early warning systems and numerical weather prediction models	observations available	2018 onwards	WG, ROE	Low-Medium
2.3	Enhance collaboration in the collection of observations at the national level. Define mechanisms and practices as needed.	More observations available	Continuing	RA-VI MG WG, Members ROE	Medium

2.4	Collaborate with CIMO in developing a feedback mechanism to CIMO on the performance of instruments and systems in Region VI. Provide feedback regularly.	Mechanism, feedback	Continuing	WG, TT-RICs	Low
2.5	Support the initiative for the extension of the E-AMDAR Programme with the participation of the Turkish Airlines	Participation of the Turkish Airlines and increased observations from AMDAR	2018	WG, ROE	Low
3. Design, planning and optimized evolution of WIGOS regional, subregional and national observing components					
3.1	Design and plan observing systems in the Region	Redesigned the Regional Observing Network	2018–2020	WG, EUMETNET	Low
3.2	Assess EGOS-IP to identify actions relevant to RA VI and Member; assign priorities to these actions	Prioritized list of actions for RA VI and for Members arising from EGOS-IP	2018 onwards	Drafting by WG /, adoption by MG	Low
3.3	Validate user requirements documented by the global RRR process against regional user requirements; use the results to update the OSCAR/Requirements database and to contribute to the update of EGOS-IP and observing system plans	Regional observing systems are responsive to regional user requirements. OSCAR/Requirements database updated	Continuing	WG,	Low
3.4	Evolve and implement national observing systems	Improved WMO observing systems in the Region	2018 onwards	Members	Medium
3.5	Validate user requirements documented by the global RRR process against national user requirements for WMO systems; use the results to update the OSCAR/Requirements database and to contribute to the update of EGOS-IP and observing system plans	Regional observing systems are responsive to national user requirements for WMO systems OSCAR/Requirements database updated	Continuing	Members	Low
3.6	Migrate from the existing RBSN/RBCN into RBON	RBON adopted by RA-VI Session	2021	RA-VI Session RA-VI MG WG Members	Low-Medium
3.7	Define subregional user requirements for observations	Updated RRR database (OSCAR)	2018–2020	Members	Low

3.8	Prepare a proposal for radar data exchange in RA VI (considering and utilizing from the existing subregional networks such as OPERA, NordRad, Baltrad)	Proposal submitted to RA-VI MG for the approval	2018	WG	Low
4. Observing system operation and maintenance					
4.1	Enhance the real-time monitoring and reporting capability of the EUCOS monitoring portal to cover a whole Region	Enhanced real time monitoring system	2018 onwards	EUMETNET WG	Medium
4.2	Consider setting up a project based on the experiences from the existing applications to deliver and share monitoring systems, software and tools to those not having such facilities (e.g. for real time monitoring of the status of the network, following and carrying out the maintenance and calibration activities, and managing the spare part inventory)	The project proposal for real time monitoring system to be implemented for the Members which need such tools	2018 onwards	WG ROE	Low
4.3	Collect best practices from Members and share them with other Regions	Documented best practices of the Region on the WMO website	Continuing	Members WIGOS-PO	Low
5. Quality management					
5.1	Implement the real-time quality monitoring of basic surface variables (temperature, pressure, humidity, wind and precipitation) using the existing systems, such as EUMETNET/EUCOS QM portal	Extended quality monitoring implemented	2018 onwards	WG, in collaboration with ECMWF and other relevant NWP centres	Medium
5.2	Prepare a study on the need and possible solutions for the implementation of real-time quality monitoring of data from various remote sensing instruments/systems	Study submitted to RA-VI MG	2018–2019	WG,	Medium

5.3	Improve collaboration among the RICs, and RICs and Members	Inter-Laboratory Calibration regularly conducted; Increased numbers of calibrated instruments	2018 onwards	TT-RIC	Low
5.4	Assist Members in implementing technical regulations on calibration and maintenance	Assistance provided	Continuing	TT-RIC	Medium
5.5	Assist Members with maintenance and calibration of the surface-based remote-sensing observing systems	Assistance provided	2018 onwards	WG,	High
5.6	Obtain as far as possible ISO/IEC 17025:2005 accreditation for calibration laboratories	Increased numbers of accredited calibration laboratories of Members	2018 onwards	Members' national calibration laboratories	High
6. Standardization and interoperability					
6.1	Implement the WMO Siting Classification Scheme through: • Provision of information and training to Members, • Adoption of new procedures by Members, • A tool to classify the sites	WMO Siting Classification Scheme is implemented in the Region	2018 onwards	Members	High
6.2	Develop a process to monitor and report on the level of regional compliance with WIGOS standards	Process developed and implemented; Report provided	2018 onwards	WG to develop a process; NWFPs to report to WIGOS-PO	Medium
6.3	Integrate radars, and exchange radar data based on existing practices adopted by OPERA	Increased number of radars integrated in OPERA; Increased number of the Members exchanging the radar data	2018 onwards	WG Members	High
6.4	Wind profiler (WP) data integration through the existing mechanism based on existing practices adopted by WINPROF	Increased number of WP integrated into the WINPROF	2018 onwards	WG Members	High

7. The WIGOS Information Resource (WIR)					
7.1	Assist Members in providing up-to-date metadata to the OSCAR/Surface and ensure its on-going maintenance	Up-to-date metadata in OSCAR/Surface	Continuing	WG	Medium
8. Data discovery and availability (data and metadata)					
8.1	Foster increased exchange of observational data and WIS metadata	Increased availability and accessibility of observations through the WIS	Continuing	WG	High
8.2	Expedite the implementation of WIS in the Region	WIS Implemented	2018 onwards	Members WG	Low
8.3	Share observations through WIS, including those from national organizations other than NMHSs	New sources of observations are available through WIS	2018 onwards	Members WG	High
9. Capacity development					
9.1	Assist Members in enhancing their WIGOS related observing capacities	Enhanced observing capabilities	Continuing	WG, ROE, WIGOS-PO	Low
9.2	Develop a Regional Capacity Development Plan, addressing the needs for: • radar data analysis and exchange; • improved availability and utilization of AMDAR data; • improved availability and utilization of high resolution radiosonde data; • improved utilization of marine data; • improved availability of LIDAR measurements for aerosol and volcanic ash	Approved Regional Capacity Development Plan	2018 onwards	WG ROE, WIGOS-PO Members	Low
9.3	Review regional and national technical training requirements and develop training opportunities such as for: • Network design • QA/QC procedures • Maintenance of instruments • calibration	A regional training plan	2018 onwards	WG in collaboration with RA VI-MG, ROE and ETR Division	Low

9.4	Assist Members in using WIR Tools for the design and management of national WIGOS networks	Initial steps taken to improve design of national networks	2018 onwards	WG in collaboration with WIGOS-PO	Low
9.5	Assist Members in implementing WIGOS metadata	Tools and procedures available to assist Members in providing the WIGOS metadata	2018 onwards	WG,	Low
10. Communication and outreach					
10.1	Raise awareness and commitment to WIGOS in the Region	Effective communication and outreach	2018 onwards	WG WIGOS-PO	Low
10.2	Raise awareness and commitment to WIGOS at the national level	Effective communication and outreach	2018 onwards	Members	Low
10.3	Develop mechanisms for improving the information sharing on WIGOS among the related entities and Members	Web based forum Regular newsletter for RA VI	2018 onwards	WG WIGOS-PO, ROE	Low

Annex

LIST OF ACRONYMS

CGMS	Coordination Group for Meteorological Satellites
DAR	Discovery, Access and Retrieval
DB	Database
DCPC	Data Collection or Production Centre (of WIS)
DRR	Disaster Risk Reduction
ET	Expert Team (of WMO Technical Commission)
GAW	Global Atmosphere Watch
GCOS	Global Climate Observing System
GCW	Global Cryosphere Watch
GEOSS	Global Earth Observation System of Systems
GFCS	Global Framework for Climate Services
GOOS	Global Ocean Observing System
GTOS	Global Terrestrial Observing System
ICG-WIGOS	Inter-Commission Coordination Group on WIGOS
ISO	International Organization of Standardization
LDCs	Least Developed Countries
NMHS	National Meteorological and Hydrological Service
OSEs	Observing Systems Experiments
OSCAR	WIGOS Observing Systems Capabilities Analysis and Review tool
QA	Quality Assurance
QC	Quality Control
QMF	Quality Management Framework
RA	Regional Association
RIC	Regional Instrument Centre
RRR	Rolling Review of Requirements
SIDS	Small Island Developing States
SoG	Statement of Guidance
SORT	"Standardization of Observations" Reference Tool (of WIGOS)
TC	Technical Commission
TOR	Terms of Reference
UNESCO	United Nations Educational, Scientific and Cultural Organization
WIGOS	WMO Integrated Global Observing System
WIP	WIGOS framework Implementation Plan

WIR	WIGOS Information Resource
WIS	WMO Information System
WCOS	World Hydrological Cycle Observation System
WWW	World Weather Watch

Resolution 7 (RA VI-17)

ESTABLISHING A REGIONAL WIGOS CENTRE FOR REGION VI UNDER THE EUMETNET OBSERVATIONS PROGRAMME MANAGEMENT

REGIONAL ASSOCIATION VI (EUROPE),

Recalling:

(1) Resolution 23 (Cg-17) – Pre-operational phase of the WMO Integrated Global Observing System,

(2) Resolution 2 (EC-68) – Plan for the WMO Integrated Global Observing System pre-operational phase 2016–2019,

(3) Decision 30 (EC-68) – Regional WMO Integrated Global Observing System Centres,

(4) Decision 30 (EC-69) – Guidance on establishing regional WMO Integrated Global Observing System Centres in pilot phase,

Noting the successful operation of the EUMETNET Composite Observing System (EUCOS) Quality Monitoring Portal at Deutscher Wetterdienst in Offenbach am Main, Germany, funded by the European Meteorological Services Network (EUMETNET) since 2008,

Noting further the decision of the EUMETNET General Assembly to support a Regional WMO Integrated Global Observing System (WIGOS) Centre for Region VI for quality monitoring tasks, limiting this service, however, to purely automated quality monitoring activities and excluding responsibilities for quality evaluation and incident management tasks,

Decides to approve the EUCOS Observing Monitoring Facility (currently located at Deutscher Wetterdienst in Offenbach am Main), operated under the EUMETNET Observations Programme Management, as a Regional WIGOS Centre for Region VI, with the responsibility for operating an automated web-based Quality Monitoring Portal to display data quality monitoring statistics for EUMETNET members, accessible to all RA VI Members;

Requests the Secretary-General to support the work of the Regional WIGOS Centre for Region VI;

Urges Members of RA VI to collaborate with the Regional WIGOS Centre to ensure that its terms of reference are met.

Resolution 8 (RA VI-17)

REGIONAL BASIC SYNOPTIC NETWORK AND REGIONAL BASIC CLIMATOLOGICAL NETWORK IN REGION VI

REGIONAL ASSOCIATION VI (EUROPE),

Noting:

(1) Resolution 5 (RA VI-16) – Regional Basic Synoptic Network and Regional Basic Climatological Network in Region VI (Europe),

(2) The *Manual on the Global Observing System* (WMO-No. 544), Volume I, Part III, 2.1.3, and the definitions of the Regional Basic Synoptic Network and Regional Basic Climatological Network,

(3) The *Manual on Codes* (WMO-No. 306),

(4) The *Manual on the Global Telecommunication System* (WMO-No. 386),

(5) Resolution 60 (Cg-17) – WMO policy for the international exchange of climate data and products to support the implementation of the Global Framework for Climate Services,

Noting further:

(1) That the establishment and maintenance of a Regional Basic Synoptic Network (RBSN) of surface and upper-air synoptic stations, adequate to meet the requirements of Members and of the World Weather Watch, constitute one of the most important obligations of Members under Article 2 of the WMO Convention,

(2) That historical climate time series from the Regional Basic Climatological Networks (RBCNs), the Global Climate Observing System (GCOS) Upper-Air Network and GCOS Surface Network at a temporal and spatial resolution necessary to resolve the statistics of climate, including trends and extremes, are included in the annex to Resolution 60 (Cg-17) as part of the relevant data and products that should be exchanged among Members to support the implementation of the Global Framework for Climate Services,

Decides:

(1) That the stations and the observational programmes listed in Annex 1 to the present resolution constitute an update of the RBSN in Region VI;

(2) That the stations listed in Annex 2 to the present resolution constitute an update of the RBCN in Region VI;

Urges Members:

(1) To secure, at the earliest date possible, full implementation of the network of RBSN and RBCN stations and observational programmes set forth in Annexes 1 and 2 to the present resolution;

(2) To comply fully with the standard times of observation, the global and regional coding procedures and data-collection standards as laid down in the *Technical Regulations* (WMO-No. 49), *Manual on the Global Observing System* (WMO-No. 544), *Manual on Codes* (WMO-No. 306), and *Manual on the Global Telecommunication System* (WMO-No. 386);

Authorizes the president of the Association to approve, at the request of the Members concerned and in consultation with the Secretary-General, amendments to the list of RBSN and RBCN stations in accordance with the procedures laid down in the *Manual on the Global Observing System* (WMO-No. 544), Volume II – Regional Aspects, Region VI – Europe, and to monitor the Members' implementation and to address non-compliance in consultation with the Member concerned and the Secretary-General.

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Note: This resolution replaces Resolution 5 (RA VI-16), which is no longer in force.

Annex 1 to Resolution 8 (RA VI-17)

UPDATE OF THE REGIONAL BASIC SYNOPTIC NETWORK IN REGION VI

INDEX	SUB INDEX	STATION NAME	OBSERVATIONS
(UPDATES TO THE RBSN)			
ESTONIA			
26038	0	TALLINN-HARKU	S, R
26045	0	KUNDA	S
26115	0	RISTNA	S
26135	0	TURI	S
26231	0	PARNU-SAUGA	S
26242	0	TARTU-TORAVERE	S
26247	0	VALGA	S
UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND			
03740	0	LYNEHAM	S
03037	0	LUSA	S
(ADDITIONS TO THE RBSN)			
FINLAND			
02755	0	YLIVIESKA AIRFIELD	S
02814	0	KEMIJARVI AIRFIELD	S
02844	0	PELLO CENTRE	S
02959	0	LAPPEENRANTA LEPOLA	S
02850	0	VARKAUS KOSULANNIEMI	S
02947	0	MIKKELI LENTOASEMA	S
02726	0	ENONTEKIÖ NÄKKÄLÄ	S
02976	0	KOTKA RANKKI	S
02799	0	KUHMO KALLIOJOKI	S

INDEX	SUB INDEX	STATION NAME	OBSERVATIONS
02714	0	VAALA PELSO	S
02738	0	PYHÄJÄRVI OJAKYLÄ	S
02881	0	RANUA LENTOKENTTÄ	S
02816	0	SODANKYLÄ VUOTSO	S
GEORGIA			
37496	0	BATUMI	S
GERMANY			
10548	1	MEININGEN	S
10771	1	KUEMMERSBRUCK	S
GREECE			
16614	0	KASTORAI (AIRPORT)	S
16643	0	AKTION (AIRPORT)	S
16684	0	SKYROS (AIRPORT)	S
16723	0	SAMOS (AIRPORT)	S
16732	0	NAXOS	S
16741	0	EL VENIZELOS (AIRPORT)	S
16716	0	ATHINAI HELLINIKON	S,R
JORDAN			
40260	0	H-5 'SAFAWI'	S
40305	0	JAFER	S
NORWAY			
01010	1	ANDOYA	S
POLAND			
12160	0	ELBLAG-MILEJEWO	S
RUSSIAN FEDERATION			
27594	1	KAZAN' (VYAZOVYE)	R
22193	0	BUGRINO	S
22292	0	INDIGA	S
22361	0	MORZHOVEC	S
22365	0	ABRAMOVSKIJ MAJAK	S
22383	0	NIZHNYAYA PESHA	S
22413	0	ENGOZERO	S
22429	0	SOLOVKI	S
22446	0	ZIMNEGORSKIJ MAJAK	S
22456	0	KEPINO	S
22481	0	MOSEEVO	S

INDEX	SUB INDEX	STATION NAME	OBSERVATIONS
22525	0	RAZNAVOLOK	S
22529	0	KOLEZHMA	S
22541	0	UNSKIJ MAJAK	S
22546	0	SEVERODVINSK	S
22551	0	MUD'JUG	S
22559	0	HOLMOGORY	S
22573	0	LESHUKONSKOE	S
22648	0	TURCHASOVO	S
22656	0	EMECK	S
22671	0	KARPOGORY	S
22686	0	VENDINGA	S
22717	0	SUOYARVI	S
22727	0	KONDOPOGA	S
22749	0	KONEVO	S
22762	0	DVINSKIJ BEREZNIK	S
22778	0	VERHNJAJA TOJMA	S
22798	0	JARENSK	S
22805	0	VALAAM	S
22820	0	PETROZAVODSK	S,R
22854	0	NJANDOMA	S
22869	0	SHANGALY	S
22876	0	KRASNOBORSK	S
22889	0	VILEGODSKOE	S
22912	0	OLONEC	S
22913	0	LODEJNOE POLE	S
22917	0	NOVAJA LADOGA	S
22925	0	VINNITSY	S
22951	0	KONOSHA	S
22974	0	NYUKSENITSA	S
22981	0	VELIKIJ USTJUG	S
22983	0	LAL'SK	S
26063	0	ST.PETERSBURG	S
26069	0	BELOGORKA	S
26072	0	SHLISSEL'BURG	S
26078	0	LJUBAN'	S
26080	0	KIRISHI	S

INDEX	SUB INDEX	STATION NAME	OBSERVATIONS
26099	0	EFIMOVSKAJA	S
26179	0	NOVGOROD	S
26268	0	DNO	S
26285	0	KRESTTSY	S
26291	0	BOROVICHI	S
26378	0	HOLM	S
26381	0	DEMJANSK	S
26393	0	VYSHNIJ VOLOCHEK	S
26456	0	OPOCHKA	S
26477	0	VELIKIE LUKI	R,S
26479	0	TOROPEC	S
26499	0	STARITSA	S
26578	0	VELIZH	S
26585	0	BELYJ	S
26702	0	KALININGRAD	R,S
26711	0	CHERNYAHOVSK	S
26784	0	POCHINOK	S
26795	0	SPAS-DEMENSK	S
26894	0	ZHUKOVKA	S
26898	0	BRJANSK	S
26976	0	KRASNAJA GORA	S
27020	0	YARSHEVO	S
27026	0	KOROBOVO	S
27106	0	USTYUZHNA	S
27108	0	OHONY	S
27164	0	KOLOGRIV	S
27176	0	VOHMA	S
27215	0	KRASNYJ HOLM	S
27223	0	POSHEHON'E	S
27277	0	VETLUGA	S
27283	0	KOTEL'NIC	S
27296	0	KUMENY	S
27316	0	KASHIN	S
27321	0	UGLICH	S
27347	0	IVANOVO	S
27417	0	KLIN	S

INDEX	SUB INDEX	STATION NAME	OBSERVATIONS
27453	0	GORODEC	S
27485	0	JOSKAR-OLA	S
27491	0	NOVYJ TOR'JAL	S
27507	0	GAGARIN	S
27511	0	NOVO-IERUSALIM	S
27523	0	PAVLOVSKIJ POSAD	S
27539	0	GUS'-HRUSTAL'NYJ	S
27577	0	SERGACH	S
27593	0	ARSK	S
27606	0	MALOJAROSLAVEC	S
27611	0	NARO-FOMINSK	S
27612	0	MOSKVA (VDNH)	S
27627	0	KASHIRA	S
27643	0	VYKSA	S
27653	0	ARZAMAS	S
27697	0	TETJUSHI	S
27707	0	SUHINICHI	RS
27745	0	SASOVO	S
27752	0	TEMNIKOV	S
27756	0	KRASNOSLBODSK	S
27760	0	SARANSK	S
27776	0	SURSKOE	S
27799	0	DIMITROVGRAD	S
27817	0	MCENSK	S
27821	0	UZLOVAJA	S
27848	0	MORSHANSK	S
27857	0	ZEMETCHINO	S
27858	0	PACHELMA	S
27872	0	INZA	S
27894	0	NOVODEVICH'E	S
27921	0	EFREMOV	S
27930	0	LIPETSK	S
27935	0	MICHURINSK	S
27955	0	BELINSKIJ	S
27957	0	KIRSANOV	S
27972	0	RADISHCHEVO	S

INDEX	SUB INDEX	STATION NAME	OBSERVATIONS
27981	0	KANADEJ	S
33924	0	CHERNOMORSKOE	S
33983	0	KERCH	S
34013	0	LIVNY	S
34047	0	ZHERDEVKA	S
34056	0	RTISHCHEVO	S
34072	0	KARABULAK	S
34083	0	HVALYNSK	S
34098	0	PUGACHEV	S
34109	0	OBOJAN'	S
34139	0	KAMENNAJA STEP'	S
34146	0	BORISOGLEBSK	S
34199	0	OZINKI	S
34202	0	GOTNJA	S
34231	0	LISKI	S
34238	0	ANNA	S
34240	0	URJUPINSK	S
34253	0	ELAN'	S
34254	0	NOVOANNENSKIJ	S
34262	0	RUDNYA	S
34267	0	DANILOVKA	S
34273	0	KRASNYJ KUT	S
34321	0	VALUJKI	S
34344	0	KAZANSKAJA	S
34356	0	FROLOVO	S
34373	0	PALLASOVKA	S
34438	0	MILLEROVO	S
34445	0	BOKOVSKAJA	S
34461	0	ILOVLYA	S
34476	0	EL'TON	S
34535	0	KAMENSK-SHAHTINSKIJ	S
34555	0	NIZHNY-CHIR	S
34578	0	CHERNYJ JAR	S
34644	0	KONSTANTINOVSK	S
34646	0	TSIMLJANSK	S
34655	0	KOTEL'NIKOVO	S

INDEX	SUB INDEX	STATION NAME	OBSERVATIONS
34662	0	MALYE DERBETY	S
34727	0	EJSK	S
34743	0	ZIMOVNIKI	S
34759	0	REMONTNOE	S
34772	0	YUSTA	S
34785	0	DOSANG	S
34845	0	GORODOVIKOVSK	S
34861	0	ELISTA	S
34868	0	IKI-BURUL	S
34871	0	UTTA	S
34887	0	LIMAN	S
34920	0	KRASNODAR	S
34954	0	SVETLOGRAD	S
34958	0	BLAGODARNYJ	S
34975	0	KOMSOMOL'SKIJ	S
34984	0	LAGAN'	S
37011	1	TUAPSE	R
37021	0	MAJKOP	S
37036	0	NEVINNOMYSSK	S
37058	0	GEORGIEVSK	S
37144	0	PROHLADNAYA	S
37163	0	KIZLJAR	S
37193	0	TEBERDA	S
37212	0	NAL'CHIK	S
37218	0	NAZRAN'	S
37235	0	GROZNYJ	S
37244	0	GUDERMES	S
37259	1	MAHACHKALA	R
37463	0	GUNIB	S
27823	0	PAVELEC	S
34920	0	KRASNODAR (AIRPORT)	S
SPAIN			
08094	0	HUESCA/PIRINEOS	S
08314	0	MENORCA/AEROPUERTO	S
TURKEY			
17170	0	VAN/FERITMELEN	S

INDEX	SUB INDEX	STATION NAME	OBSERVATIONS
17260	0	GAZIANTEP/OGUZELI	S
17270	0	SANLIURFA	S
UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND			
03649	0	BRIZE NORTON	S
03047	0	TULLOCH BRIDGE	S
(DELETIONS FROM THE RBSN)			
BOSNIA AND HERZEGOVINA			
14652	0	BJELASNICA	S
CYPRUS			
17600	0	PAPHOS AP	S
17607	0	ATHALASSA	R
17609	0	LARNACA AIRPORT	S
FINLAND			
02755	0	YLIVIESKA AIRPORT	S
02814	0	KEMIJARVI LENTOKENTTA	S
02844	0	PELLO KK MUSEOTIE	S
GERMANY			
10618	0	IDAR-OBERSTEIN	
JORDAN			
40260	0	H-4 RWASHED	S
40310	0	MA’AN	S
NORWAY			
01018	0	SLETTNES LH	S
01152	0	BODO	R
01300	0	GULLFAKS C	S
POLAND			
12160	0	ELBLAG	S
ROMANIA			
15015	0	OCNA SUGATAG	S
15020	0	BOTOSANI	S
15090	0	IASI	S
15108	0	CEAHLAU TOACA	S
15120	0	CLUJ-NAPOCA	S
15150	0	BACAU	S
15170	0	MIERCUREA CIUC	S

INDEX	SUB INDEX	STATION NAME	OBSERVATIONS
15200	0	ARAD	S
15230	0	DEVA	S
15260	0	SIBIU	S
15280	0	VARFU OMU	S
15292	0	CARANSEBES	S
15310	0	GALATI	S
15335	0	TULCEA	S
15346	0	RAMNICU VALCEA	S
15350	0	BUZAU	S
15360	0	SULINA	S
15410	0	DROBETA TURNU SEVERIN	S
15420	0	BUCURESTI BANEASA	S
15450	0	CRAIOVA	S
15460	0	CALARASI	S
15470	0	ROSIORII DE VEDE	S
15480	0	CONSTANTA	S
RUSSIAN FEDERATION			
22140	0	SVYATOJ NOS	S
22820	0	PETROZAVODSK	S
26063	0	ST.PETERSBURG	S
26477	0	VELIKIE LUKI	R
26702	0	KALININGRAD	S
27595	1	KAZAN'	R
27612	0	MOSKVA (VDNH)	S
27703	0	KALUGA	S
27707	0	SUHINICHI	S
27857	0	ZAMETCHINO	S
34730	0	ROSTOV-NA-DONU	S
34927	0	KRASNODAR KRUGLIK	S
SLOVENIA			
14008	0	KREDARICA	S
14014	0	LJUBLJANA/BRNIK	S
14015	0	LJUBLJANA/BEZIGRAD	R
14021	0	SLOVENJ GRADEC	S
14023	0	CELJE	S
14026	0	MARIBOR/SLIVNICA	S

INDEX	SUB INDEX	STATION NAME	OBSERVATIONS
14031	0	MURSKA SOBOTA	S
14105	0	PORTOROZ/SECOVLJE	S
14106	0	NOVA GORICA	S
14121	0	NOVO MESTO	S
14122	0	CERKLJE OB KRKI	S
SPAIN			
08094	0	HUESCA/MONFLORITE	S
08160	1	ZARAGOZA/BASE AEREA	S
08314	0	MENORCA/MAHON	S
TURKEY			
17170	0	VAN	S
17260	0	GAZIANTEP	S
17272	0	SANLIURFA/MEYDAN	S

S = Surface; R= Radiosonde; W= Radiowind

Annex 2 to Resolution 8 (RA VI-17)

UPDATE OF THE REGIONAL BASIC CLIMATOLOGICAL NETWORK IN REGION VI

INDEX	SUB INDEX	STATION NAME	CLIMAT	GSN	GUAN
(UPDATES TO THE RBCN)					
ESTONIA					
26038	0	TALLINN-HARKU	X		
26214	0	VILSANDI	X		
26242	0	TARTU-TORAVERE	X	X	
(ADDITIONS TO THE RBCN)					
FINLAND					
02778	0	SAVONLINNA PUNKAHARJU	X		
02788	0	KUOPIO MAANINKA	X		
02942	0	KANKAANPAA NIINISALO PUOLVOIM	X		
GREECE					
16714	0	ATHENS OBSERVATORY	X		
16716	0	ATHINAI HELLINIKON	X		

INDEX	SUB INDEX	STATION NAME	CLIMAT	GSN	GUAN
JORDAN					
40260	0	H-5 'SAFAWI'	X		
40305	0	JAFER	X		
POLAND					
12160	0	ELBLAG-MILEJEWO	X		
PORTUGAL					
08535	0	LISBOA/GEOFISICO	X	X	
REPUBLIC OF MOLDOVA					
33815	0	CHISINAU	X		
33883	0	KOMRAT	X		
RUSSIAN FEDERATION					
34920	0	KRASNODAR	X	X	
26063	0	ST. PETERSBURG	X		
27612	0	MOSKVA (VDNH)	X		
SPAIN					
08314	0	MENORCA/AEROPUERTO	X		
TURKEY					
17170	0	VAN FERITMELEN	X	X	
17260	0	GAZIANTEP/OGUZELI	X		
(DELETIONS FROM THE RBCN)					
ARMENIA					
37789	1	YEREVAN AERO	X		X
AUSTRIA					
11035	1	WIEN/HOHE WARTE	X	X	
BOSNIA AND HERZEGOVINA					
14652	0	BJELASNICA	X	X	
CROATIA					
14430	0	ZADAR RS			X
CYPRUS					
17600	0	PAPHOS AP	X	X	
17607	0	ATHALASSA			X
17609	0	LARNACA AIRPORT	X	X	
FINLAND					
02278	0	PUNKAHARJU LAUKANSAARI	X		
02788	0	MAANINKA HALOLA	X		

INDEX	SUB INDEX	STATION NAME	CLIMAT	GSN	GUAN
02942	0	KANKAANPAA NIINISALO PUOLUSTUSVOIMAT	X		
GERMANY					
10393	1	LINDENBERG			X
GREENLAND (DENMARK)					
04270	1	MITTARFIK NARSARSUAQ			X
IRELAND					
03953	1	VALENTIA OBSERVATORY			X
ITALY					
16245	1	PRATICA DI MARE RDS			X
JORDAN					
40250	0	H-4 RWASHED	X	X	
40310	0	MA'AN	X	X	
NORWAY					
01001	1	JAN MYEN			X
POLAND					
12160	0	ELBLAG	X		
PORTUGAL					
08508	0	LAJES (ACORES)			X
08535	0	LISBOA/GEOF	X	X	
ROMANIA					
15023	0	SUCEAVA	X		
15085	0	BISTRITA	X	X	
15090	0	IASI	X		
15120	0	CLUJ-NAPOCA	X		
15247	0	TIMISOARA	X		
15260	0	SIBIU	X		
15280	0	VARFU OMU	X	X	
15292	0	CARANSEBES	X		
15310	0	GALATI	X		
15350	0	BUZAU	X		
15360	0	SULINA	X	X	
15420	0	BUCURESTI BANEASA	X		X
15450	0	CRAIOVA	X		
15480	0	CONSTANTA	X		
RUSSIAN FEDERATION					
26063	0	ST. PETERSBURG	X		

INDEX	SUB INDEX	STATION NAME	CLIMAT	GSN	GUAN
27612	0	MOSKVA (VDNH)	X		
34927	0	KRASNODAR KRUGLIK	X	X	
SLOVAKIA					
11903	0	SLIAČ	X		
SLOVENIA					
14008	0	KREDARICA	X		
14015	0	LJUBJANA/BEZIGRAD	X		
SPAIN					
08314	0	MENORCA/MAHON	X		
TURKEY					
17170	0	VAN	X	X	
17260	0	GAZIANTEP	X		

Resolution 9 (RA VI-17)

REGIONAL IMPLEMENTATION OF COMMISSION FOR HYDROLOGY INITIATIVES

REGIONAL ASSOCIATION VI (EUROPE),

Recalling:

(1) Resolution 10 (RA VI–16) – Regional Association VI Working Group on Climate and Hydrology,

(2) Resolution 4 (CHy-15) – Governance of the Global Hydrometry Support Facility,

(3) Resolution 5 (CHy-15) – Data operations and management,

(4) Resolution 8 (CHy-15) – Development of a pilot WMO Global Hydrological Status and Outlook System,

(5) Resolution 9 (CHy-15) – Capacity-building in hydrology and water resources management,

(6) Resolution 1 (EC-69) – *Manual on the WMO Integrated Global Observing System* (WMO-No. 1160), Section 2 and Section 8,

(7) Resolution 18 (Cg-17) – Hydrology and Water Resources Programme,

(8) Resolution 19 (Cg-17) – World Hydrological Cycle Observing System Office,

(9) Resolution 6 (EC-68) – Global Hydrometry Support Facility,

(10) Decision 49 (EC-69) – WMO priority actions in hydrology and water resources management,

Noting that the Commission for Hydrology, at its fifteenth session in December 2016, took several decisions of relevance to RA VI activities related to hydrology and water management, such as: the implementation of the Global Hydrometry Support Facility (HydroHub) to foster coordination, innovation, research and development in support of hydrological observation and data exchange; the further implementation of phase I of the WMO Hydrological Observing System (WHOS) – the online portal to near-real-time and historical hydrological data; the approval of the initial concept of WHOS phase II; the establishment of a Global Hydrological Status and Outlook System (HydroSOS) with the aim of developing WMO capability to assess current global status of water availability; and the development of guidance on hydrometric network optimization and prioritization,

Noting also the increased importance being placed on the availability of water resources within a country, basin and region for sustainable development, and the need to have clear and accurate indications of existing and future availability of water resources for planning purposes,

Noting further that the European Committee for Standardization/Technical Committee (CEN/TC) 318 on Hydrometry is currently developing guidance on hydrometric network design and its optimization,

Mindful of the need for reliable hydrological data to support the achievement of the Sustainable Development Goals (SDGs), especially SDG-6 on water and sanitation, and the European Union Water Framework Directive,

Noting with concern the present condition of hydrological observing networks and their operations and maintenance in many RA VI countries, and the difficulties encountered in raising decision-makers' awareness of their importance,

Convinced that advances in the area of water resources assessment and in improving the accuracy and reliability of hydrological observations and the dissemination of derived information will have positive impacts on water resources management and planning, in developing climate adaptation strategies and in other hydrological applications within and beyond Regional Association VI,

Considering that the RA VI Working Group on Climate and Hydrology and the RA VI Hydrology Forum identified network design and optimization, data management and data quality control, and support to hydrological education as priority themes for the Region,

Recognizing the need to foster cooperation between meteorology and hydrology to improve the quality of the services provided,

Recognizing further the importance of Members to contribute to, and receive benefit from, the HydroHub and related innovative activities, and the need to reach out to academia and the research community to foster development, testing and implementation of innovative technologies, as done through the workshop "Innovation in Hydrometry - from ideas to operation" jointly organized by the International Association of Hydrological Sciences Measurements and Observations in the Twenty-first Century (MOXXI) Working Group and WMO, on 4–5 December 2017 in WMO headquarters,

Welcoming:

(1) The successful implementation of WaterML 2.0 in support of data exchange in the framework of the activities of the International Sava River Basin Commission, and its forerunning role in the development of WHOS,

(2) The installation and commissioning of the Meteorological, Climatological and Hydrological Database Management System (MCH) in four Member countries in the Region to improve their data management capabilities,

Acknowledging:

(1) That several RA VI Members are facing difficulties in ensuring the functioning and maintenance of their hydrometric networks, as well as the proper collection, management and dissemination of data, and could be strengthened by and benefit from adopting advances in monitoring, data management and communication technologies,

(2) That, in contrast, several other RA VI Members have already made available online their hydrological data, this potentially contributing in a significant manner to WHOS and HydroSOS,

(3) That academia and the research community in RA VI, supported by funding programmes such as Copernicus or Horizon 2020, are developing a large array of innovative technologies for hydrometry that can benefit Members in RA VI and other Regions,

Urges Members, in accordance with Resolution 60 (Cg-17) – WMO policy for the international exchange of climate data and products to support the implementation of the Global Framework for Climate Services, Resolution 25 (Cg-XIII) – Exchange of hydrological data and products, and Resolution 40 (Cg-XII) – WMO policy and practice for the exchange of meteorological and related data and products including guidelines on relationships in commercial meteorological activities, to make hydrological data and the appropriate metadata available through WHOS, taking into account national and international data regulations;

Invites Members:

(1) To take concrete steps to improve monitoring capacities at national and regional level, also through enhanced international cooperation, in synergy with activities of the Commission for Hydrology such as HydroHub and WHOS, among other international programmes, as well as the Global Cryosphere Watch;

(2) To identify and communicate to the HydroHub Advisory Council the needs and gaps in hydrological data collection, measuring technology, data interpretation tools and hydrological information systems that could be addressed by the HydroHub;

(3) To take steps to ensure closer cooperation between communities specializing in meteorology, the cryosphere and hydrology, allowing the consequent design and implementation of end-to-end systems (measured data, models, forecasts and warning dissemination) for water resources assessment and management, taking into account the limitations imposed by national data policies, as well as the national allocation of competencies in the dissemination of alerts;

(4) To engage with academia and the research community in order to promote the development, testing and operational deployment of innovative hydrometric technologies and partner with the Global Innovation Hub to foster their wider adoption;

(5) To contribute to the identification and definition of products related to HydroSOS;

(6) To nominate their national focal points for WHOS;

Decides to liaise with CEN/TC 318 on the theme of network design to provide consistent and coherent guidance to Members;

Requests the Secretary-General:

(1) To provide technical support and training to Members and regional and subregional institutions wanting to provide their hydrological data to WHOS, also through the implementation of MCH and WaterML 2.0;

(2) To prepare mechanisms to facilitate the integration of hydrological metadata into the Observing Systems Capability Analysis and Review (OSCAR) tool;

Asks the president of RA VI, in consultation with the Regional Hydrological Adviser, to nominate regional focal points for WHOS and create an adequate mechanism allowing Members to actively contribute to the development of WHOS in support of hydrological data exchange.

Resolution 10 (RA VI-17)

DEVELOPMENT OF THE REGION VI AMDAR PROGRAMME UNDER THE IATA/WMO COLLABORATION ON AMDAR

REGIONAL ASSOCIATION VI (EUROPE),

Recalling Decision 60 (EC-69) – Potential future collaboration of WMO and the International Air Transport Association on the operation and development of the WMO Aircraft Meteorological Data Relay Programme, which endorsed the establishment of a Working Arrangement between WMO and the International Air Transport Association (IATA) under which the two organizations would work together to develop the terms of reference and concept of operations for future collaboration on the Aircraft Meteorological Data Relay (AMDAR) Programme,

Noting that Decision 60 (EC-69) also requested the Secretary-General, in coordination with the president of the Commission for Basic Systems, to work with IATA to further finalize and establish the Working Arrangement between WMO and IATA and to subsequently develop the concept of operations for the future possible collaboration of WMO and IATA on the operation and development of the AMDAR Programme (see the annex to the present resolution),

Noting with satisfaction that a side event at the RA VI Regional Conference was held on the IATA/WMO collaboration on AMDAR, during which a draft concept of operations was presented,

Having examined the draft concept of operations for the IATA/WMO collaboration on AMDAR,

Having considered the implications of the concept of operations in committing RA VI to coordinating the establishment and maintenance of national and regional requirements for AMDAR observations and the resources for their provision and management,

Having been informed that IATA will play a leading role in ensuring that the agreed required AMDAR observations are provided efficiently and economically through coordination with its member airlines and the wider aviation industry,

Convinced that the collaboration will lead to the expansion and enhancement of the WMO AMDAR observing system globally and, as a result, bring further benefits to meteorological applications and improvements to forecasting skills and services for aviation,

Endorses the proposed IATA/WMO collaboration on AMDAR under the draft concept of operations;

Requests the Secretary-General, Executive Council and Commission for Basic Systems to continue to coordinate the process of informing and seeking the endorsement of the concept of operations of the IATA/WMO collaboration on AMDAR among all regional associations;

Decides that, subject to IATA and WMO entering into a formal collaboration on AMDAR based on a recommendation of the Executive Council at its seventieth session in June 2018 and decision by Eighteenth World Meteorological Congress in 2019, RA VI will aim to compile its requirements for AMDAR observations by July 2018 with a view to beginning the development of the WMO Region VI AMDAR Programme under the IATA/WMO collaboration in January 2019

and potentially beginning operation of the Programme in January 2020, if this timeline is possible;

Encourages other regional associations to consider the same action under a timeline appropriate to their administrative operations.

Annex to Resolution 10 (RA VI-17)

BACKGROUND INFORMATION ON THE IATA/WMO COLLABORATION ON AMDAR

References:

Website of the International Air Transport Association (IATA):
http://www.iata.org/about/pages/index.aspx

1. Introduction

1.1 In late 2016, Members of the Secretariat of the International Air Transport Association (IATA), approached WMO to inform that, at the behest of its member airlines, it had undertaken a study on the operation of the WMO AMDAR programme, which had made the following recommendations:

(a) IATA to work with the WMO to expand the AMDAR programme across the globe and establish a more equitable cost-recovery mechanism for the participating airlines; and

(b) IATA to set up a global turbulence database with real-time data transmission to airlines during flight operations.

1.2 During an initial meeting between representatives of the secretariats of WMO and IATA, held in Geneva on 12 December 2016, it was agreed that there appeared to be significant advantages and mutual benefits to their respective members, if a formal collaboration on the future operation of the AMDAR programme were to be established.

1.3 Based on further collaboration with IATA and discussion and consideration of the matter by CBS and CIMO Management Groups and the CBS Expert Team on Aircraft-Based Observing Systems (ET-ABO), a Decision 60 (EC-69) was made to establish the IATA/WMO Working Arrangement on the Operation of the AMDAR Programme, under which the two organizations would work together to develop the terms of reference and concept of operations, based on which a future collaboration on AMDAR might be defined and later approved by a subsequent decision of the Executive Council and Congress. The Working Arrangement was formally established in July 2017.

1.4 Since then the ET-ABO has been working with IATA to develop the Concept of Operations for the IATA/WMO Collaborative AMDAR Programme, for which an initial draft is provided in RA VI-17/INF. 3.2(5).

2. Key Aspects of the IATA/WMO Collaboration on AMDAR Impacting RA VI

2.1 Under the Concept of Operations for the IATA/WMO Collaborative AMDAR Programme (IWCAP) the following are the key aspects:

(a) Each RA would be responsible for establishing and maintaining regional requirements for AMDAR observations, primarily based on national member

requirements and resourcing to pay for observations and support for the programme operation;

(b) IATA and WMO would develop a cost framework for supporting the operation and development of IWCAP to meet national and regional requirements for observations;

(c) IATA and WMO would jointly manage funds to support the IWCAP and reimburse airline partners for the costs of the programme development and provision of observations on the WIS;

(d) RAs would operate and maintain Regional Data Processing Centres and support planning activities and data and quality management operations through the establishment of regional working groups.

2.2 Given the successful operation of the EUMETNET/E-AMDAR programme on a regional collaborative basis, it is proposed that WMO Region VI might become the first WMO Regional AMDAR Programme to work towards operation under the IWCAP based on a planning and development period over 2018 and 2019 with a view to commencing operations at the start of 2020.

Resolution 11 (RA VI-17)

REGIONAL INSTRUMENT CENTRES

REGIONAL ASSOCIATION VI (EUROPE),

Recalling the RA VI Regional Operating Plan 2016–2019 that recognizes the need to foster efficient collaboration between Regional Instrument Centres (RICs) and National Meteorological and Hydrological Services in RA VI and to establish a network of calibration centres in the Region,

Noting that three RICs (Toulouse (France), Bratislava (Slovakia) and Ljubljana (Slovenia)) were designated to support Members of RA VI,

Appreciating that France, Slovakia and Slovenia have already positively responded to the invitation to reconfirm their willingness to continue hosting and providing the service of their RICs to RA VI Members and that the RICs of Slovakia and Slovenia are currently accredited according to the International Organization for Standardization/International Electrotechnical Commission (ISO/IEC) 17025:2017 standard,

Recalling further the current terms of reference of RICs published in the WMO *Guide to Meteorological Instruments and Methods of Observation* (WMO-No. 8),

Noting with appreciation:

(1) That Germany is offering to provide its laboratory facilities to perform the function of RIC in the fields of temperature, pressure, humidity, and wind speed and direction,

(2) That Turkey is offering to provide its laboratory facilities to perform the function of RIC in the fields of temperature, humidity, pressure, wind speed and direction, precipitation, and solar radiation,

(3) That, resources permitting, the RICs of RA VI are also offering support to Members of other regional associations,

Having been informed that the Commission for Instruments and Methods of Observation has performed an evaluation of the two candidate RICs based on the information they provided and has recognized that both meet the requirements listed in the RIC terms of reference, namely having the needed facilities, established and documented procedures and staff required to perform the expected RIC functions, and are accredited according to ISO/IEC 17025:2017,

Decides to designate:

(1) The laboratory of Hamburg/Oberschleissheim (Germany) as RIC for RA VI with full capabilities and functions, according to the current RIC terms of reference;

(2) The laboratory of Ankara (Turkey) as RIC for RA VI with full capabilities and functions, according to the current RIC terms of reference;

Requests all RICs of RA VI:

(1) To provide support to RA VI Members and, if possible, to Members of other Regions;

(2) To be proactive in promoting traceability throughout the Region and carrying out capacity development activities for Members;

(3) To do their utmost to continue complying with the RIC terms of reference, and to strive to become certified according to ISO/IEC 17025:2017;

(4) To reconfirm their willingness to continue providing RIC services to RA VI Members prior to the next session of the Association;

Requests the Management Group:

(1) To regularly assess the needs of RA VI Members to be addressed by RICs;

(2) To collaborate with the Commission for Instruments and Methods of Observation to verify the capabilities and performance of RA VI RICs;

Requests the Secretary-General to amend the WMO regulatory and guidance documents to reflect these new designations.

Resolution 12 (RA VI-17)

COORDINATION OF WMO INFORMATION SYSTEM ACTIVITIES

REGIONAL ASSOCIATION VI (EUROPE),

Noting that the Commission for Basic Systems has been developing:

(1) An implementation plan for the WMO Information System (WIS) 2.0 Strategy,

(2) Guidance and standards to support systematic information management practices,

(3) Procedures for Global Information System Centres to monitor the operations of WIS,

(4) Revised audit schedules and procedures for centres registered in WIS,

Noting further:

(1) That during the period 2014 to 2017 there was significant overlap between the work of the RA VI Working Group on Technology Development and Implementation (WG-TDI) and the European Centre for Medium-range Weather Forecasts Regional Meteorological Data Communication Network (RMDCN) Operations Committee,

(2) That the work of the Operations Committee included close interaction with the Commission for Basic Systems Expert Team on Communication Techniques and Systems,

Having been informed:

(1) That the practice of transmitting real-time reports through a chain of Regional Telecommunication Hubs (RTH) introduced delays that could be avoided,

(2) That the roles of the RTHs within the World Weather Watch include activities in addition to data transmission,

(3) That the Regional Meteorological Data Communication Network made it possible for centres in the Region to send and receive reports and data directly to and from the Global Information System Centres,

Invites the Chairperson of the Commission for Basic Systems Expert Team on Communication Techniques and Systems to participate ex officio in the Association's working groups and activities that involve the WIS;

Endorses the training identified in the annex to the present resolution as a priority activity to push forward the national uptake of WIS services and facilities in the Region;

Requests its Management Group, through the appropriate mechanism:

(1) To review the terms of reference of the WG-TDI Task Team on WIS Development and Implementation or its successor to avoid duplication with the terms of reference of the RMDCN Operations Committee;

(2) To reassess the role of RTHs in the Region, including operational, technical and capacity development aspects;

(3) To coordinate at regional level the implementation of the anticipated recommendations of the Commission for Basic Systems on WIS audit schedules and on operational monitoring by Global Information System Centres;

(4) To monitor WIS training and development, including maintaining the table in the annex to the present resolution;

Requests Members:

(1) To send real-time reports directly to their principal and secondary Global Information System Centres;

(2) To deliver and participate in the training identified in the annex to the present resolution;

Encourages Members:

(1) To offer additional training related to WIS and inform the Secretary-General of their intentions;

(2) To undertake pilot projects that inform, further develop or validate the concepts and implementation of WIS 2.0 and to share knowledge, technology and expertise from these projects to support the adoption of WIS 2.0;

Further requests its Management Group:

(1) To coordinate information sharing about WIS 2.0 pilot projects and their outcomes;

(2) To keep Members informed of WIS 2.0 implementation progress;

(3) To provide feedback from RA VI Members to the Commission for Basic Systems on WIS 2.0 implementation;

Informs the Commission for Basic Systems that Members would benefit from more information about the technical infrastructure supporting WIS 2.0 and that a comparison of the functional architectures for the original WIS and WIS 2.0 would assist greatly in Members' planning;

Requests the Secretary-General to support the training activities identified in the annex to the present resolution and to facilitate sponsorship where identified.

Annex to Resolution 12 (RA VI-17)

WIS TRAINING ACTIVITIES

Proposed WIS training activities for 2018 to 2021

Title	Proposed Quarter and Year	Centre(s) providing Training	Targeted WIS competencies	Targeted participants and expected pre-existing capabilities	Supported languages	Justification and expected outcome	Required sponsorship
Ordering Data through GISC Offenbach	Q2/2019	Offenbach	Usage of GISC Offenbach Portal Search and Retrieval Subscriptions	Managers of Data Requests in AoR	English	Knowledge of GISC Offenbach Portal Self-Service Data Requesting	
Metadata Management at GISC Offenbach	Q1/2020	Offenbach	DAR Metadata	Data Providers in AoR	English	Aim is to sharpen the awareness of the benefits of metadata Further complete the WIS-GISC-Offenbach Set	

Title	Proposed Quarter and Year	Centre(s) providing Training	Targeted WIS competencies	Targeted participants and expected pre-existing capabilities	Supported languages	Justification and expected outcome	Required sponsorship
Information and Communication Technologies for Meteorological Services		GISC Exeter/ Toulouse		Junior or mid-level Meteorologists or Meteorological Technicians engaged in ICT sector General knowledge of ICT area	English	Developing WIS knowledge and helping WIS implementation in national level	
Managing Discovery Metadata		GISC Exeter/ Toulouse	Training Fundamentals	WIS trainers from Centres in GISC Exeter and Toulouse area of responsibility Participants will be expected to have a broad knowledge of information processes in their organization.	English	Training pack was created and delivered last year in Toulouse. For future training this may be delivered through an online course.	Online training, maybe sponsored via the OpenWis consortium.
Onsite training and technical support	Every year (3–4 countries in a year)	GISC Exeter/ Toulouse	1, 2, 3, 4, 5		English	Each country has different levels of skill and knowledge, and faces different challenges. This will help them with tailored technical support.	

Title	Proposed Quarter and Year	Centre(s) providing Training	Targeted WIS competencies	Targeted participants and expected pre-existing capabilities	Supported languages	Justification and expected outcome	Required sponsorship
Overview of WIS. Russian segment of WIS. Technical architecture of GISC Moscow. Demonstration of the functionality of GISC Moscow, principles of area meteorological data communication network (AMDCN), connecting a NC to GISC Moscow, using metadata to search for and retrieve data (DAR) in WIS (WMO Core Metadata Profile, especially training and supervision). Practical exercises	Q1/2018	GISC Moscow, RMTC Moscow	Knowledge of the WIS and the services provided by GISC Moscow. Use search and retrieval on the portal of GISC Moscow. Subscription.	Experts from centres in the AMDCN of GISC Moscow Manage data	Russian	Knowledge of the Portal of GISC Moscow Able to request and subscribe to data Plan for connecting the participant's NC to GISC Moscow and a backup GISC.	

Title	Proposed Quarter and Year	Centre(s) providing Training	Targeted WIS competencies	Targeted participants and expected pre-existing capabilities	Supported languages	Justification and expected outcome	Required sponsorship
Metadata management in GISC Moscow. Virtual National Centres in GISC Moscow: - general information about the remote workplace for accessing and editing NC metadata in GISCs by the operators of NCs within the GISC AMDCN. Organization of the work space of a "Virtual NC" (GISC profile) - how to obtain the profile of the work space of a specialist of the NC. - loading of data and creation of metadata	Q2/2018	GISC Moscow, RMTC Moscow	Metadata editors	Data providers in WIS	Russian	NC is able to add and modify datasets in the WIS through GISC Moscow	

Title	Proposed Quarter and Year	Centre(s) providing Training	Targeted WIS competencies	Targeted participants and expected pre-existing capabilities	Supported languages	Justification and expected outcome	Required sponsorship
Organization and interaction of GISC Moscow and NC/DCPCs in its area of responsibility for implementing the WIS monitoring.	Q4/2019	GISC Moscow, RMTC Moscow	Monitoring in the area of responsibility of GISC	Experts responsible for NC, DCPCs	Russian	WIS monitoring within the area of responsibility of the participant's centre	

Resolution 13 (RA VI-17)

SEAMLESS DATA-PROCESSING AND FORECASTING SYSTEM

REGIONAL ASSOCIATION VI (EUROPE),

Recalling:

(1) Resolution 11 (Cg-17) – Towards a future enhanced integrated and seamless Data-processing and Forecasting System, which initiated a process for the gradual establishment of an enhanced integrated and seamless WMO Data-processing and Forecasting System, in light of the conclusions of the first World Weather Open Science Conference (Montreal, Canada, August 2014),

(2) That Seventeenth World Meteorological Congress requested the Executive Council to formulate the terms of reference for this process and a description of the set of products the System should produce, for consideration by Eighteenth Congress in 2019,

(3) Decision 55 (EC-68) – Implementation of the Seamless Data-processing and Forecasting System, which endorsed the vision for the Seamless Data-processing and Forecasting System and established a Steering Group on the Seamless Data-processing and Forecasting System (following the request by Seventeenth Congress), chaired by the president of the Commission for Basic Systems (CBS) and comprising representatives of technical commissions and regional associations and the Chairperson and co-Chairperson of the CBS Open Programme Area Group on Data-processing and Forecasting Systems (DPFS), with the main task to develop and present the implementation plan for the Seamless DPFS,

(4) Resolution 17 (EC-69) – Seamless Data-processing and Forecasting System, which re-established the Executive Council Steering Group on the Seamless Data-processing and Forecasting System, chaired jointly by the presidents of the Commission for Basic Systems and Commission for Atmospheric Sciences,

Noting with satisfaction that substantial progress has been made by the Steering Group in developing the concept for the Seamless DPFS, including a draft white paper and an outline of the implementation plan,

Noting that the revised *Manual on the Global Data-processing and Forecasting System* (WMO-No. 485) was adopted by the Executive Council at its sixty-ninth session,

Mindful of the need for regional contribution for the successful implementation of the Seamless DPFS and that RA VI has a number of advanced Global Data-processing and Forecasting System (GDPFS) centres which would contribute significantly to its implementation,

Decides:

(1) To provide full support to the Steering Group on the Seamless Data-processing and Forecasting System for the further development and implementation of this initiative;

(2) To include the Seamless DPFS in its work programme for the intersessional period, following the guidance of the Steering Group;

Tasks the president of RA VI with nominating the RA VI representative to the Steering Group on the Seamless Data-processing and Forecasting System;

Invites Members to identify their national focal points for the Seamless DPFS who will liaise with the RA VI representative to the Steering Group in order to facilitate its implementation;

Encourages advanced GDPFS centres in RA VI to pilot a Seamless Data-processing and Forecasting System at national and regional levels based on the guidance and proposals defined in the implementation plan, and share the results and lessons learned with all WMO Members in order to improve the process.

Resolution 14 (RA VI-17)

REGIONAL ASSOCIATION VI HYDROLOGY FORUM

REGIONAL ASSOCIATION VI (EUROPE),

Recalling the establishment of the RA VI Hydrology Forum to create a platform for hydrologists within the Region to discuss matters of common concern, promote the recognition of WMO as a key partner in the field of water-related issues and enable cooperation and discussions among the hydrological community (National Hydrological Services) in the field of operational hydrology within RA VI,

Recalling also that at its sixteenth session the Association, noting that the Hydrology Forum work should be conducted mainly through electronic means, supported the proposal of the president and Management Group that the meetings of the Forum be organized every two years to provide guidance and advice to relevant subsidiary bodies and Members in the field of hydrology,

Recalling further that sustaining and developing further the European Hydrology Forum as an effective collaborative mechanism between the National Hydrological Services was a key task for the RA VI Working Group on Climate and Hydrology in the last intersessional period (Resolution 10 (RA VI-16) – Regional Association VI Working Group on Climate and Hydrology),

Noting with satisfaction that three meetings of the Hydrology Forum have already been organized with growing success and increasing participation from Members (Koblenz, Germany, May 2012 (45 participants representing 27 Members); Warsaw, Poland, September 2014 (46 participants, representing 29 Members); and Oslo, Norway, September 2016 (53 participants, representing 32 Members)),

Decides that the RA VI Hydrology Forum will continue as the platform for enhancing debate and exchange on emerging issues between the National Hydrological Services of the Region, European Union bodies, academia and research communities, as well as the private sector;

Requests the RA VI president, in coordination with the Regional Hydrological Adviser and the Management Group, to further foster the activities of the Hydrology Forum as a vocal hydrological platform in the Region, increase its outreach to the wider hydrological community (including the academic, research and private sectors), consider its outcomes in decisions on RA VI structure and activities, communicate its outcomes and ensure that the Forum continues to meet every two years;

Requests the Secretary-General to raise adequate resources to support the organization of these two intersessional meetings.

Resolution 15 (RA VI-17)

PUBLIC–PRIVATE ENGAGEMENT

REGIONAL ASSOCIATION VI (EUROPE),

Recalling:

(1) Resolution 67 (Cg-17) – WMO guidance on partnerships with the private sector,

(2) Decision 73 (EC-68) – Cooperation between the public and private sectors for the benefit of society,

(3) Decision 61 (EC-69) – Public–private engagement: a road map to the Eighteenth World Meteorological Congress,

Recalling further the outcome of the special dialogue on the complementary and cooperative contributions of public and private sector institutions to meteorology and hydrology, which took place at the sixty-eighth session of the Executive Council,

Having discussed the future role of National Meteorological and Hydrological Services and the collaboration with the private sector in the global weather enterprise at its Regional Conference held on 5 and 6 February 2018, as well as the related key issues to be addressed through future activities of the Association and through appropriate actions by other WMO bodies,

Acknowledging the large variety of institutional and business models and legal frameworks existing in RA VI Member States concerning the definition of the role and scope of National Meteorological and Hydrological Services and related possibilities for partnerships, across the service-delivery value chain, with the private sector and academic entities,

Acknowledging further the projected increase in demand for meteorological, climatological and hydrological services, which opens opportunities for a rapid growth of the private-sector share in service delivery,

Recognizing that the rapidly changing technology is a strong driver for significant growth of the global weather enterprise and that the rapid uptake of technological innovation will be crucial in future service delivery,

Expressing concern for the observed trend of reduced public funding of National Meteorological and Hydrological Services in many RA VI Member States that affects the sustainability of essential services and the ability to improve and upgrade,

Agrees on the need for WMO to provide a platform for recurrent dialogue with the private sector and relevant partner organizations, in view of building better common awareness of the respective roles and capabilities and in order to facilitate the creation of opportunities for cost-efficient, mutually beneficial collaborative and partnership solutions;

Urges Members to exchange examples of good practices of cooperation with the private sector and academia, as well as to share experiences of difficulties thereof;

Invites the Executive Council:

(1) To expedite a review of the existing WMO data policies spelled out in Resolution 40 (Cg-XII) – WMO policy and practice for the exchange of meteorological and related data and products including guidelines on relationships in commercial meteorological activities, Resolution 25 (Cg-XIII) – Exchange of hydrological data and products, and Resolution 60 (Cg-17) – WMO policy for the international exchange of climate data and products to support the implementation of the Global Framework for Climate Services, and to

consider the need for their updates and amendments in view of the evolving service delivery models, relevant national and international legal frameworks, and the needs of society and the economic sector for improved information and services bringing benefits to all;

(2) To consider creating possibilities for a broader engagement of expertise from academia and the private sector in the WMO standard-making processes;

Requests the Secretary-General to support organizing events at global and regional level to discuss public–private engagement in the context of a global weather enterprise, and inform crucial WMO policy decisions thereon.

Resolution 16 (RA VI-17)

REGIONAL ASSOCIATION VI MANAGEMENT GROUP

REGIONAL ASSOCIATION VI (EUROPE),

Noting the WMO Strategic Plan 2016–2019 and the RA VI Regional Operating Plan 2016–2019,

Considering:

(1) The effective work done by the RA VI Management Group during the period 2013–2017,

(2) The growing need to plan and coordinate Association activities in order to achieve the expected results and key outcomes of the WMO Strategic Plan, WMO Operating Plan and RA VI Regional Operating Plan,

(3) The need to establish an effective and efficient structure of subsidiary bodies and to guide and coordinate their activities during the intersessional period, including making necessary adjustments to the working structure to address emerging issues,

(4) The need to constantly keep abreast of Members' needs and issues and communicate their requirements through appropriate technical commissions and the Secretariat,

(5) That a mechanism is needed to address issues not handled by other working groups or task teams, in particular activities related to Expected Results 6, 7 and 8 of the WMO Strategic Plan 2016–2019,

Decides:

(1) To re-establish the Management Group of Regional Association VI;

(2) To endorse the terms of reference of the Management Group as follows:

(a) To advise and assist the president of RA VI on all matters related to the work of the Association, in particular:

(i) On emerging matters requiring action during the intersessional period;

(ii) In prioritizing, planning, coordinating and actively managing the work of the Association and its subsidiary bodies, as well as in monitoring progress in accordance with the RA VI Regional Operating Plan;

(iii) In ensuring adequate working mechanisms for the Association, including the establishment of relevant task teams based on proposals by the chairpersons of the working groups, and making necessary adjustments as needed to achieve desired outcomes;

(iv) In addressing emerging issues and challenges as identified by Regional Association VI, and ensuring that these issues are adequately included in the workplans of the working groups;

(v) In ensuring continuity of the strategic planning process and developing coordinated regional inputs for the future WMO Strategic Plan and related Operating Plan, including regional priorities and key outcomes;

(vi) In maintaining and promoting partnership and collaboration with international and regional partner organizations, and other organizations and research institutes contributing to the implementation of the WMO Strategic Plan;

(vii) In seeking ways of improving coordination with relevant bodies of the European Union to foster participation and representation of Members in relevant projects and activities;

(b) To coordinate and monitor the implementation of the RA VI Regional Operating Plan and other regional implementation plans approved by the president;

(c) To assess and evaluate the performance of Regional Association VI as per the WMO Strategic Plan;

(d) To oversee, in collaboration with the Secretariat, the activities of the regional centres;

(e) To coordinate the activities of the Association and its subsidiary bodies with respect to cross-cutting issues, such as the implementation of the Global Framework for Climate Services, disaster risk reduction and capacity development, and to coordinate the activities of the Association and its subsidiary bodies to complement and support activities of technical commissions, taking into account the needs of Members and the existing resources and capacity development mechanisms;

(f) To address, on a systematic basis, the need for harmonization of capabilities for the provision of meteorological, climatological and hydrological services between different subregions;

Designates Ms Cristina Alionte Eklund (Sweden) as the Regional Hydrological Adviser to the RA VI president, with the terms of reference as stipulated in Annex IV of the General Regulations of WMO (Regulation 168);

Requests the president to form the Management Group, which will include the president acting as Chairperson, the vice-president, the Regional Hydrological Adviser to the president, and selected directors of National Meteorological and Hydrological Services in such a way as to ensure appropriate geographical representation and improve gender balance;

Requests the president and the Management Group to establish the working structure of the Association as soon as possible, and to readjust the structure when needed, ensuring the continuation of activities envisaged and planned in accordance with the RA VI Regional Operating Plan, taking into account the recommendation of the RA VI Regional Conference (*Regional Association VI (Europe): Abridged Final Report of the Seventeenth Session* (WMO-No. 1210), annex to Decision RA VI-17/2);

Authorizes the president:

(1) To invite, as appropriate, other directors of National Meteorological and Hydrological Services and other experts to participate in the meetings of the RA VI Management Group, as necessary;

(2) To take needed decisions on urgent matters on behalf of the Association after consultation with the Management Group, and submit these, as necessary, to other WMO constituent and subsidiary bodies;

Further requests the president:

(1) To ensure that, subject to availability of resources, the Management Group meets annually or as needed, preferably in conjunction with other meetings and events, using electronic means to the extent possible;

(2) To report regularly to the Association during the intersessional period and at its next regular session on the activities of the Management Group and relevant decisions taken on behalf of the Association, and to establish a platform for interactive discussion of documents before the next session of RA VI;

Requests the Secretary-General to take into account the work of the Management Group in the provision of support to Regional Association VI, especially through the Regional Office for Europe.

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Note: This resolution replaces Resolution 8 (RA VI-16), which is no longer in force.

Resolution 17 (RA VI-17)

GENDER EQUALITY

REGIONAL ASSOCIATION VI (EUROPE),

Recalling:

(1) Decision 77 (EC-68) – WMO Gender Action Plan (hereinafter referred to as the Action Plan),

(2) Resolution 59 (Cg-17) – Gender equality and empowerment of women, which addresses the WMO Gender Equality Policy,

Acknowledging the role of WMO in implementing the outcomes of the Conference on the Gender Dimensions of Weather and Climate Services and in facilitating implementation of the gender aspects of the Sendai Framework for Disaster Risk Reduction 2015–2030, the Paris Agreement under the United Nations Framework Convention on Climate Change, and the 2030 Agenda for Sustainable Development,

Reaffirming the goal of achieving gender equality within WMO and gender-sensitive weather, hydrological, climate and related environmental services that will contribute to an improved response to the specific needs and social and economic circumstances of women and men,

Recognizing the priority actions for 2016–2019 of the Action Plan endorsed by the Executive Council at its sixty-eighth session,

Recognizing further the need to implement the Action Plan in the period 2016–2019 in RA VI,

Having examined the statistics on the participation of women and men in WMO governance,

Decides:

(1) To designate a member of the Management Group as responsible for gender equality;

(2) To develop action plans on implementation of the WMO Gender Equality Policy within the areas of responsibility of RA VI with appropriate resource allocation;

(3) To incorporate gender in the RA VI Regional Operating Plan, including in relevant regional key outcomes and regional key performance indicators;

(4) To maintain statistics on equality within RA VI and report progress to the Executive Council every financial period;

Urges Members:

(1) To nominate more females as members of WMO constituent bodies and their working structures;

(2) To use the Action Plan as guidance and undertake relevant actions at the national level;

(3) To facilitate implementation of the Action Plan through the provision of in-kind and voluntary contributions to the WMO Gender Trust Fund;

(4) To nominate national focal points on gender;

Encourages Members to increase the involvement of women in the work of the Association;

Decides to approve the present resolution.

Resolution 18 (RA VI-17)

REVIEW OF PREVIOUS RESOLUTIONS OF REGIONAL ASSOCIATION VI

REGIONAL ASSOCIATION VI (EUROPE),

Noting Resolution 12 (RA VI-16) – Review of previous resolutions and recommendations of the Association,

Having examined the previous resolutions,

Considering:

(1) That a number of resolutions adopted before its seventeenth session have been revised and incorporated in resolutions of the seventeenth session,

(2) That other previous resolutions have been incorporated in appropriate WMO publications or have become obsolete,

(3) That some of the previous resolutions are still to be implemented,

Decides:

(1) To keep in force Resolutions 1 (RA VI-16), 3 (RA VI-16), 6 (RA VI-16), 7 (RA VI-16), and 16 (XIII-RA VI);

(2) Not to keep in force Resolutions 2 (RA VI-16), 9 (RA VI-16), 10 (RA VI-16) and 11 (RA VI-16);

(3) To publish the list of resolutions kept in force in the annex to the present resolution.

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Note: This resolution replaces Resolution 12 (RA VI-16), which is no longer in force.

Annex to Resolution 18 (RA VI-17)RESOLUTIONS KEPT IN FORCE

(1) Resolution 1 (RA VI-16) – Implementation of the WMO Strategy for Service Delivery in Regional Association VI (Europe)

(2) Resolution 3 (RA VI-16) – Regional Climate Centre Network in Regional Association VI (Europe)

(3) Resolution 6 (RA VI-16) – WMO Information System Implementation Plan for Regional Association VI (Europe)

(4) Resolution 7 (RA VI-16) – Updating records in the Operational Information Service

(5) Resolution 16 (XIII-RA VI) – Support for the Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology

APPENDIX 3. DECISIONS ADOPTED BY THE SESSION

Decision RA VI-17/1

Regional Association VI (Europe),

Approves the provisional agenda as proposed by the president of RA VI;

Approves the report of the representative of the Secretary-General on credentials in accordance with WMO General Regulations 21 to 24;

Adopts the establishment of committees and rapporteurs in accordance with Regulations 23 and 32, as follows, and such other committees, as it deems necessary:

(1) Nomination Committee:

Chairperson: *Ms Elena Mateescu – Romania*

Member(s): *Ms Laurence Frachon – France*

(2) Rapporteur on Resolutions:

Ms Maria Germenchuk – Belarus

Agrees on the programme of work of the session:

(1) Working hours of the meetings: 9.30 a.m. – 12.30 p.m. and 2.30 p.m. – 5.30 p.m.;

(2) Arrangement and allocation of agenda items for the session;

Decides to suspend General Regulation 110 for the whole duration of the session to permit rapid processing of documents in accordance with General Regulation 3;

Decides that in conformance with General Regulation 112 summarized minutes are not required for the session.

Decision RA VI-17/2

Regional Association VI (Europe) endorses the outcomes of the Regional Conference "Setting the landscape for National Meteorological and Hydrological Services (NMHSs) in RA VI, Europe" to be considered in the planning of future activities of the RA VI.

Regional Association VI (Europe) decides that the RECO outcomes and recommendations report, and the RA VI-17 Session documents identify the important issues for the Region.

The top priority areas for the next intersessional period, not necessarily in priority order, are:

(1) The future role of NMHSs and the collaboration with the Private sector in the Global Weather Enterprise: WMO providing a platform for dialogue.

(2) Improving Service Delivery-Disaster Risk Reduction: GMAS Vision

(3) Impact based services: Training and sharing information

(4) Hydrology: observations network, data exchange/WHOS regional implementation, forecasting and service delivery

(5) Arctic and High Mountain Areas: Observations, Research and Services

(6) WIGOS – Implementation and Regional Centres

Regional Association VI (Europe) requests the Management Group to:

(1) Communicate these priorities to WMO EC and Congress.

(2) Put in place the working mechanism for the region to focus on delivering these priority areas.

See the annex to the present decision.

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Decision justification: The Regional Conference held in Geneva, on 5 and 6 February 2018 discussed important matters for the future work of the NMHSs and provided recommendations to Association for their consideration at the RA VI-17 session.

Annex to Decision RA VI-17/2

RECOMMENDATIONS

1. A rapidly changing environment: The future role of NMHSs and the collaboration with the Private sector in the Global Weather Enterprise

The changing landscape and future role of NMHSs

1.1 RECO acknowledges the large variety of institutional and business models, and legal frameworks existing in the RA VI Members with regard to the definition of the role and scope of the NMHS and related possibilities for partnerships, across the service delivery value chain, with the private sector and academia entities.

1.2 RECO acknowledges further the projected growth of the demand for meteorological, climatological and hydrological services which opens opportunities for a rapid growth of the private sector share in the service delivery.

1.3 RECO recognizes that the rapidly changing technology is a strong driver for a significant growth of the global weather enterprise and that the rapid uptake of technological innovation will be crucial in the future service delivery.

1.4 RECO expresses concern of the observed trend of reduced public funding of NMHSs in many RA VI Members. This affects the sustainability of essential services and the ability to improve and upgrade services supporting decision-making.

Private sector and (Global) Weather Enterprise

1.5 RECO agreed on the need for WMO Secretariat to provide a platform for dialogue with private sector including donor organizations and academia.

1.6 RECO agreed on the need for WMO Secretariat to provide a platform for exchange of best practices considering cooperation with private sector.

1.7 RECO recommends to evaluate the application of Res 40 (Annex 1 – essential datasets and Annex 3 in particular) with respect to free exchange of data considering recent and possible future developments in public private partnerships (PPP).

1.8 RECO recognizes that joint work of appropriate bodies and Technical Commissions of WMO and NMHSs together with private sector on technical standardization is required.

1.9 RECO agreed on the need for WMO Secretariat to organize in the next intersessional period series of workshops and conferences with the private sector on Global Weather Enterprise.

2. Improving Service Delivery-Disaster and climate resilience

WMO GMAS

2.1 RECO clearly recognizes that the responsibility and control of the information, with regards the availability, integrity and dissemination into the GMAS is under the authority of NMHSs. Concerning the production of risk evaluation and alert production, is according the national regulations.

2.2 RECO emphasizes that the requirements for GMAS should not be in conflict with the requirements of national warning systems.

2.3 RECO recognizes that GMAS framework could help NMHSs to harmonize the international presentation of their warning services, agreed upon common CAP or other industry-standard protocols.

Impact based services

2.4 RECO agreed on the need for WMO Secretariat to organize workshop(s) for NMHSs to share information on providing Impact Based Services (IBS) and to organize user forums to study user requirements on what specific IBS are needed.

2.5 RECO recognizes the need for education and training on customer liaison skills for personnel delivering IBS.

2.6 RECO recognizes that integrated value chain, based on two way communication is best practise.

Service Delivery in Arctic and High Mountain Areas

2.7 RECO strongly supports the commitment of WMO to engage with the Arctic Council and its Programmes seeking to achieve well-maintained and sustained observation networks, in particular for monitoring changes in the cryosphere and water resources, and for and continuous monitoring in the Arctic, and urges similar engagements regarding Arctic research and services, within the framework of the Polar Prediction Project, the Arctic Regional Climate Centres, and other emerging opportunities.

2.8 RECO recommends RAVI to urge the WMO to continue its leadership role on the further implementation of space based observations of the arctic and high mountain regions, including using high elliptical orbit satellites and emerging technologies such as nanosatellites, and to seeking funding opportunities through public private partnerships, including telecom partners.

2.9 RECO recognized the need to position the cryosphere observations and related services in the WMO information value chain and recommends that WMO strengthens its role in the coordination of the provision of services in arctic and high mountain regions, reflecting the importance of the cryosphere in the earth system model.

3. Enhancing the Earth system observations and Data Exchange – strengthening the technical foundations for the future

Global observing system-future needs

3.1 RECO recognizes that not all the Members have yet fully implemented their WIS obligations (NC, DCPC, GISC) and requested Members to urge realising them.

3.2 RECO recommends Members to increase visibility of available data in the WIS through well documented metadata (including restrictions on use/data policy) and to ensure the quality, integration, standardization and the sustainability of all observations.

3.3 RECO noted the importance of strategic vision for the WIGOS 2040 and recognizes the need of the Members to expand, develop or integrate observing networks, in particular wind and temperature profiler networks, as well as urban and environmental observations.

3.4 RECO recognizes the need to focus on the global observing system including the alignment of strategies and requirements, as well as profiting from lessons learnt from regional initiatives. Closing the gaps in other regions can also be beneficial to RA VI.

3.5 RECO recognizes the need to improve and encourage the exchange of data within the WMO community but also outside (3rd party) including easy data access and a clear data policy.

WIGOS Vision 2040

3.6 RECO urges Members to improve and enhance the participation in WIGOS.

3.7 RECO considers the regional WIGOS Centres as assets of great value to the Members of the Region taking into account the needs and expectations from Members.

3.8 RECO recognizes that sharing of knowledge, best practices and experiences among Members could be of great benefit. The main areas of interest are 3rd party collaboration, new instruments, complementing surface data with satellite measurements, outsourcing NHMSs tasks and IT solutions for future data demands.

3.9 RECO recognizes that the support of the GCW as an observing network in the Arctic and High Mountain areas is beneficial to all Members and important to estimate impacts on the ecosystem.

3.10 RECO recommends RAVI to urge the WMO to review the recommendations on required data density of observations and if necessary to update the Annex to Resolution 40 in particular with regard to future data demands.

Global Cryosphere Watch

3.11 RECO recognizes that observing networks in the Arctic and High-Mountain reporting on snow, ice, permafrost are crucial for informing national policies on mitigating

natural hazards (e.g. avalanches, floods, landslides) and for the estimation of impacts on the ecosystem.

3.12 RECO recognizes the importance of cryosphere as fresh water source for many countries and communities, at high and mid latitudes, and supports the further development of the Global Cryosphere Watch, as a mechanism to address the need for information on the state of the cryosphere supporting policy decisions.

3.13 RECO recognizes the importance of cryosphere as an integral part of the Earth System, and acknowledges the growing evidence that changes in the Arctic impact the climate at lower latitudes. RECO calls for focused research on further understanding the role of cryosphere in the Earth System and the Arctic-Mid-latitude teleconnections.

3.14 RECO recommends RA VI to establish a CryoNet network in the eastern regions of RA VI, as a joint activity with the Global Cryosphere Watch, and seeking to address the challenges of sustaining observing networks at high elevation.

3.15 RECO recommends RA VI to request the Permanent Representatives of Members to promote the collaboration and engagement of all communities (e.g. research, hydrology) involved in cryosphere observations, research, services. at national and regional level.

4. Working smarter-How to organize ourselves to meet the needs of the region and narrow the performance gaps of the National and Hydrological Services in RA VI

Strategy for European NMHSs 2016–2025

4.1 RECO took note of the 2016–2025 Strategy of the European National Meteorological and Hydrological Services.

4.2 RECO suggests that RA VI Members take note of the experience of 31 Members who are signatories to the Strategy as useful contribution to the planning processes of NMHSs.

4.3 RECO recommends RA VI to request Members to assess the possibility of using this Strategy along with WMO Integrated Strategic Planning Handbook (WMO-No. 1180) as a platform for preparing the RA VI Strategy for NMHSs.

How to establish strategic partnerships?

4.4 RECO acknowledges the Nordic model as an excellent example for building strategic partnerships in other subregions.

Working together for improved data exchange in Europe-benefit for all?

4.5 RECO recognizes collaboration and complementarity as the fundamental principles for work going forward.

4.6 RECO recognizes the need for improved quality and exchange of data as one of the priority areas of collaboration with the final goal of open data policy.

Working structure and mechanisms of RA VI

4.7 RECO recommends, considering the tasks in coordination and communication the WMO Office for Europe has, that it would be highly desirable to adjust the size and capacity of the Office to the tasks given in the next intersession period in line with strategic priorities of WMO.

4.8 RECO called for a flexible working structure and giving the mandate to the President and the Management Group to reassess and adjust the working structure when needed.

4.9 RECO recommends to make use of the RAVI experts working in the Technical Commissions, so as to assure a good communication between the Members, the TCs and the related WMO Programmes. Integration of external experts into the working bodies should be considered.

Decision RA VI-17/3

Regional Association VI (Europe) decides to explore the development of a regional Agrometeorological Centre to assist countries with relevant agrometeorological data and information such as soil moisture and phenology, further elaboration of agrometeorological bulletins and services, and training activities.

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Decision justification: During several missions to Romania for WMO Commission for Agricultural Meteorology meetings, there were discussions on how to better foster agricultural meteorology issues in RA VI on the issues of soil moisture and phenology monitoring, assist Members with enhancing agrometeorological bulletins and training activities. One of the ideas was to explore the development of a regional Agrometeorological Centre that could be hosted by a NMHS, possibly in Romania.

Decision RA VI-17/4

Regional Association VI (Europe) decides:

(1) To encourage Members to implement impact-based forecast (IBF) and warning services in order to enable impact-based decision support services;

(2) To support Members in developing requirements for impact-based services for polar regions and high mountain areas as demand for such services continues to rise due to increased human activities as a result of climate change;

(3) To encourage training activities in support of impact-based forecast and warning services;

(4) To investigate a community of practice for sharing best practices and case studies;

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Decision justification: Decision 4 (EC-69) – Impact-based decision support services, which emphasized: the importance of Members to implement IBF; the potential to use Regional Training Centres (RTCs) to accelerate acquisition of knowledge and skills; and the need for exchange of digital data to support impact-based forecasting

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Decision RA VI-17/5

Regional Association VI (Europe) decides:

(1) To encourage Members to develop urban integrated hydrometeorological, climate and environment services so as to provide decision-makers and society with seamless integrated urban services[1];

(2) To encourage Members to share best practices and case studies and contribute to the development of guidelines on urban environment service delivery.

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Decision justification: Decision 41 (EC-69) – Guidelines for the development of an integrated operational platform to meet urban service delivery needs.

Decision RA VI-17/6

Regional Association VI (Europe) decides:

(1) To support Members as necessary in order for them to adopt and operationalize the use of the Common Alerting Protocol (CAP) standard for coding alerts, including provision of warning feeds to the Filtered Alert Hub (prototype for the WMO Alert Hub)[2];

(2) To ensure that all Members nominate editors to edit the WMO Register of Alerting Authorities and to ensure that the editors do actually edit their national register pages;

(3) To ensure that all Members join the World Weather Information Service (WWIS) initiative, provide forecasts for at least 5 days where possible and that they increase the number of cities for which they provide climate and forecast information[3];

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Decision justification: *Abridged Final Report with Resolutions of the Seventeenth World Meteorological Congress* (WMO-No. 1157), general summary, paragraphs 3.1.58 and 3.1.59, and 9.1.1 (p)

Decision RA VI-17/7

Regional Association VI (Europe) agrees that the activities in marine meteorology of the RA VI Members during the current WMO financial period should be focused on the following implementation areas:

(1) Strengthening Met-Ocean forecasting services including the delivery of the IMO/WMO Worldwide Met-Ocean Information and Warning Service (WWMIWS), and ensuring, as appropriate:

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1 See Concept Note on PWS Programme assistance to NMHSs to develop operational urban focused service delivery here.

2 https://github.com/filtered-alert-hub/filtered-alert-hub/wiki

3 Members can view how they are currently performing in the WWIS initiative by opening the portal as follows: Portal: https://portal.worldweather.org/; Username: wmopws; Passcode: wmo935B

(a) The role of METAREA Coordinators;

(b) The nomination of national marine services focal points for Members' domestic coastal services;

(c) The enhancement of the provision of Maritime Safety Information, including the Arctic;

(2) Supporting the introduction of competency standards into marine forecasting and supporting compliance to these standards within their NMHS;

(3) Supporting the development of multi-hazard, impact-based forecast services in the marine sector;

Regional Association VI (Europe) also agrees to strengthen collaboration with the

(1) Copernicus-Marine Environment Monitoring Services (CMEMS);

(2) Relevant Working Groups of the Arctic Council and their relevant Projects on Maritime Safety in the Arctic region;

Urges Members:

(1) To provide regular updates on the status of their compliance with the WWMIWS and WMO requirements for the provision of marine meteorological services, including any implementation difficulties thereof;

(2) To provide a national marine services focal point for their domestic and coastal services;

Requests the Management Group of RA VI to include the appropriate tasks on marine meteorology in the Regional Operating Plan;

Requests the co-presidents of the Joint Commission for Oceanography and Marine Meteorology (JCOMM) to ensure expert support to marine meteorology regional activities aimed at capacity development in the above implementation focus areas.

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Decision justification: "Discussions at Cg-17 urged more prominence for marine activities in the WMO Strategic Plan, based on the fact that many coastal Members lack a sufficient marine meteorological forecasting service, without which human lives are unnecessarily lost. Additionally, the provision of Maritime Safety Information (MSI), which includes meteorological forecasts & warnings, is a fundamental component of the UN Safety of Life at Sea (SOLAS) convention, to which many Members are signatories; this information is delivered through the Global Maritime Distress and Safety System (GMDSS) and the delivery of the WorldWide Met-Ocean Information & Warnings Service (WWMIWS) and the introduction of METAREAS and METAREA Coordinators are both core functions of the GMDSS.

The vision on the Services & Forecast Systems Programme Area, as approved by JCOMM-5, and the introduction of the WWMIWS Committee to oversee the provision of Maritime Safety Information, are both key elements in ensuring that Members continue to provide consistent and potentially life-saving MSI; this is supported by updated versions of the Manual on Marine Meteorological Services (WMO-No.558) and Guide for Marine Meteorological Services (WMO-No.471) which were endorsed at JCOMM-5. Additionally, to ensure that, at national level, there is consistency of the approach to providing this information, JCOMM-5 endorsed the introduction of National Marine Focal Points within each Member to ensure that services which are not mandated by the SOLAS convention are still subject to the highest levels of consistency for mariners."

Decision RA VI-17/8

Regional Association VI (Europe) decides:

(1) To urge Members to expedite the migration of their quality management systems (QMS) for the provision of aeronautical meteorological services to the new International Organization for Standardization (ISO) 9001:2015 standard before September 2018; to assist the Secretariat in updating the information on the QMS implementation by RA VI Members to be available by 31 January 2019;

Note: Updated WMO guidance on the migration to the new ISO standard 9001:2015 is provided in the new edition of the WMO Guide to the Implementation of a Quality Management System for National Meteorological and Hydrological Services (WMO-No.1100, edition 2017)

(2) To encourage Members not yet engaged in cross-border SIGMET coordination to do so through arrangements with their neighbouring Members leveraging the experience and guidance gained by using a subregional coordination approach, such as the MET Alliance, the Northern Europe Aviation Meteorology Consortium (NAMCON), and the Russian Federation – Belarus bilateral arrangements;

(3) To monitor, through the RA VI Management Group, the Members' progress in the migration to the ICAO meteorological information exchange model (IWXXM) in accordance with the established timeline (currently planned to become a mandatory requirement as of November 2020), and to coordinate with the CAeM assistance to those Members who may need to build their capacity to comply with the IWXXM requirements ;

(4) To invite Members to consider the outcomes of the European Conference on Meteorology for Aviation (ECMA-2015), the EC-69 Special Dialogue on the Future of Aeronautical Meteorological Services, and the Aeronautical Meteorology Scientific Conference (AeroMetSci-2017) in the planning of their future aeronautical meteorological systems, services and related research;

(5) To urge Members to strengthen the partnership and coordination with relevant regional and national aviation stakeholders (regulators, other air navigation service (ANS) providers, airport management, airline users) to further a user-focused development and provision of advanced value-added meteorological services for air traffic management;

(6) To encourage Members to share information on national cost-recovery mechanisms for aeronautical meteorological service provision in view of improving implementation guidance and to facilitate their harmonization, as demanded by industry, and to leverage the EUMETNET's experience in this regard.

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Decision justification: Resolution 66 (Cg-17) – WMO support to evolving aeronautical meteorological services; Decision 43 (EC-68) – Action Plan – Meteorological services for aviation; Decision 42 (EC-69) – Future of aeronautical meteorological services, and its annex – Summary of the Special Dialogue on the Future of Aeronautical Meteorological Services; ECMA-2015 report. AeroMetSci-2017 report; Results of the CAeM Global Survey 2016/2017.

Decision RA VI-17/9

Regional Association VI (Europe) decides to investigate the possibility of establishing in pilot mode a Regional WIGOS Centre for the Adriatic Sea Area observing systems, located in Split, for a period of up to two years, with responsibilities as provided in the general Terms of

Reference for Regional WIGOS Centres (Decision 3 (EC-68) – WMO disaster risk reduction governance, user-interface mechanisms and Disaster Risk Reduction Road Map);

Requests the Management Group to support the establishment of the RWC in Split, Croatia;

Urges Members to actively participate in the implementation of RWCs in RA VI;

Requests the Secretary-General to provide the necessary assistance and Secretariat support for the establishment of the RWC in Split, Croatia;

Authorizes its president to approve the pilot RWC(s) with applications from RA VI Members on behalf of the Association, in consultation with the Management Group;

Invites the partners to participate in establishing the RWC in Split.

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Decision justification: Final Report, WIGOS Workshop for Regional Association VI (RA-VI) with Focus on Marine Meteorological and Oceanographic Observing Requirements (Split, Croatia, September 2016) (http://www.wmo.int/pages/prog/www/WIGOS-WIS/reports/WIGOS-RA-6-Ocean-Report-Final.pdf)

Decision RA VI-17/10

Regional Association VI (Europe) decides to investigate the possibility of establishing in pilot mode a Regional WIGOS Centre for Russian speaking countries

Requests the Management Group to support the establishment of this RWC taking into account WMO Eurasian subregional office (Minsk, Belarus) as a potential site for an appropriate pilot project;

Urges Members to actively participate in the implementation of an RWC for Russian speaking countries in RA VI;

Requests the Secretary-General to provide the necessary assistance and Secretariat support for the establishment of the RWC for Russian speaking countries;

Authorizes its president to approve the pilot RWC(s) with applications from RA VI Members on behalf of the Association, in consultation with the Management Group, and to coordinate with the President of Regional Association II regarding the practical implementation of the RWC;

Invites the partners to participate in establishing the RWC for Russian speaking countries.

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Decision justification: Final Report, Joint RA II and RA VI Workshop on WIGOS, Minsk, September 2017 (https://www.wmo.int/pages/prog/dra/eur/documents/RA-II-VIEurasianWIGOSWorkshopReport.pdf)

For more information, see RA VI-17/INF. 3.2(1).

Decision RA VI-17/11

Regional Association VI (Europe) decides to continue the support the work of CBS SG-RFC in order to ensure all RA VI spectrum issues related to observation and communication systems are addressed by SG-RFC;

Invites Members of RA VI to consider proposing experts to represent WMO matters in their national spectrum management bodies;

Requests the RA VI working body on WIS and WIGOS to monitor radio frequency matters, in particular those relating to the upcoming World Radiocommunications Conference 2019 (WRC-19);

Requests the Secretary-General to continue to facilitate the participation and representation of RA VI NMHS experts in radio frequency coordination matters, including the SG-RFC.

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Decision justification: The importance of participation in radio frequency coordination within WMO and the International Telecommunications Union Radio Regulations process is defined in Resolution 29 (Cg-17) – Radio frequencies for meteorological and related environmental activities, Decision 36 (EC-68) and Decision 22 (CBS-16) – Preserving the radio-frequency spectrum for meteorological and related environmental activities at the World Radiocommunication Conference 2019. RA VI lies within the International Telecommunication Union (ITU) regional body European Conference of Postal and Telecommunications Administrations (CEPT). It is represented by experts from the CBS Steering Group on Radio Frequency Coordination (SG-RFC). SG-RFC also coordinates on behalf of RA VI in other organizations such as the Space Frequency Coordination Group (SFCG) and Coordination Group on Meteorological Satellites (CGMS).

Decision RA VI-17/12[4]

Regional Association VI (Europe) decides to establish the following subregional radar networks:

(1) BLACKRAD, to be operated by 11 Members[5] in the Black Sea subregion;

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[4] This Decision follows recommendation of the RA-VI Management Group at its meeting in Vilnius, Lithuania, from 26 to 28 April 2017, based on the proposal of the Working Group on Technology Development and Implementation Task Team on WIGOS, to establish two additional subregional Radar Networks in the Black Sea and South-East Europe subregions. It refers to Resolution 4 (RA-VI-16) – Regional WIGOS Implementation Plan for Regional Association VI (Europe), which includes activity 6.3.4 on Radar data integration through the existing mechanism, i.e. OPERA, and is based on existing practices adopted by OPERA. RA-VI Operating Plan 2016–2019 also includes deliverable 4.1.3 on Radar systems integration and wind profiler integration. Existing radar networks in RA-VI, such as OPERA, BALTRAD *[Secretariat]* and NORDRAD are quite successful. However, (i) these radar networks have not been covering the whole Association region, and Members not participating in these networks do not have access to weather radar data from existing radar networks, (ii) a large number of radars are not currently organized in subregional networks, and (iii) operational experiences derived from existing radar networks will provide unique guidance for the establishment, operation and governance of new subregional radar networks. This Decision is meant to consider (i) the need to increase the number of radars integrated into OPERA, and harmonize subregional radar networks based on OPERA practices, and (ii) the need to provide guidance on further harmonization of, and greater access to, weather radar data with the respective data policy.

[5] Armenia, Azerbaijan, *[Secretariat]* Bulgaria, Georgia, Kazakhstan, *[Secretariat]* Republic of Moldova, Romania, Russian Federation, The former Yugoslav Republic of Macedonia, Turkey, Ukraine.

(2) SEERAD, to be operated by 18 Members[6] in the South-East Europe subregion;

and Requests

(1) Members in the Black Sea and the South-East Europe subregions to put in place coordination mechanisms between Members operating the BLACKRAD and SEERAD networks to address the objectives listed in Annex 1 to the present decision;

(2) The Working Group on Technology Development and Implementation, or its successor as appropriate, to propose governance of the BLACKRAD and SEERAD networks in consultation with and concurrence of the Members of the relevant subregions, and with consideration of the guidance provided in Annex 2 to the present decision;

It also authorizes the president of the Association to adopt the proposed governance on behalf of the Association.

Annex 1 to Decision RA VI-17/12

REQUIREMENTS FOR COORDINATION MECHANISMS UNDER THE BLACKRAD AND SEERAD NETWORKS

The BLACKRAD and SEERAD Networks are being established to address the following objectives:

(1) Collaboration on the operations and maintenance of the Networks, including quality control and generation and delivery of high quality integrated weather radar products to the subregions, including composite products to meet user requirements for Numerical Weather Prediction, Nowcasting and Very Short Range Forecasting, production of early warnings, etc.;

(2) Routine exchange of weather radar data in real-time across Members within the Networks (consideration should be given to collaboration with the Inter Programme Expert Team on Operational Weather Radars with regard to data exchange format);

(3) Provision of WIGOS metadata about the radars operated in BLACKRAD and SEERAD Networks to the WMO Weather Radar Database, and make sure that national focal points are nominated;

(4) Contribution towards the development of platforms, software and data formats for radar data exchange;

(5) Provision of solutions concerning identified weather radar operations issues such as those related to wind turbines operations, radio frequency protection, etc.;

(6) The sharing of information and expertise and the development of regional best practices and guidance on points (1) to (5) above, building on experience and standards of the OPERA network;

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[6] Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Greece, Hungary, Israel, Jordan, Lebanon, Montenegro, Romania, Serbia, Slovenia, Syrian Arab Republic, The former Yugoslav Republic of Macedonia, Turkey, Ukraine.

(7) Integration of existing subregional networks with the new ones to cover whole Region in line with the Regional WIGOS Implementation Plan;

(8) Providing a point of reference in support of application of weather radar data and products.

Annex 2 to Decision RA VI-17/12

GUIDANCE REGARDING THE GOVERNANCE OF THE BLACKRAD AND SEERAD NETWORKS

The following elements ought to be considered when developing the governance of the BLACKRAD and SEERAD Networks:

(1) Membership and participation to subregional radar networks will be open for any Member in RA VI, in particular for those located in the considered subregion or not participating in the existing radar networks;

(2) Subregional radar networks could contribute to a regional radar network covering whole of the Association, as well as provide a platform for inter-regional radar networks to exchange radar data among the Members of different regions;

(3) While designing the subregional radar networks, the communication and data transmission capabilities (capacity of GTS, availability and accessibility of dedicated TCP-IP networks like the RMDCN, or usability of Internet) should be considered;

(4) Governance for the implementation of the subregional radar networks shall evaluate two options, i.e.

   (a) A centralized approach whereby one or two centres for each subregional network will operate a Radar Data Centre (RDC) to collect the data, generate products and distribute them for the use by Members, and

   (b) A decentralized approach whereby all Members would share data on equal terms, and each member would have the possibility to process radar data according to its requirements either using a common data processing framework or using its own software, if available;

(5) In option (a) above, an RDC would be hosted and operated by volunteer Members having sufficient capability to perform the required tasks and functions to be defined according to their Terms of Reference, and could also optionally be a component of an future Regional WIGOS Centres (RWCs).

Decision RA VI-17/13[7]

Regional Association VI (Europe) decides to establish a pilot RBON for RA VI, comprised initially of the merging of all RBSN and RBCN stations of RA VI, and invites Members of RA VI to consider proposing inclusion of additional surface-based observing stations in the pilot RBON for RA VI, such as weather radars, wind profiler systems, lightning detection systems, data buoys, voluntary observing ships and aircrafts;

The Association also requests the RA VI working body on WIS and WIGOS to review the candidate RBON stations proposed by Members, and to make recommendation to the president of the Regional Association for including them in the pilot RBON for RA VI;

It authorizes the president of the Regional Association to approve in consultation with the Secretary-General, amendments to the list of the pilot RBON stations for RA VI proposed by the RA VI working body in WIS and WIGOS, in accordance with the RBON Concept, and to monitor the Members' implementation of the network in compliance with the RBON Concept.

Decision RA VI-17/14

Regional Association VI (Europe) decides to support and contribute to a potential regional workshop in Europe in the time frame 2019–2020 which will identify needs and regional cooperation.

See the annex to the present decision and RA VI-17/INF. 3.2(3).

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Decision justification: The benefit of a regional workshop will be to improve key monitoring networks to fill gaps in regions. This workshop will be organized by the GCOS secretariat in coordination with WIGOS, UNFCCC and other relevant partners and national coordinators and the involvement and coordination with existing capacity-building activities, for example WCRP programmes such as CLIVAR or CORDEX. The expected output will describe regional plans and priority national needs.

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[7] This Decision is taking note of Decision 21 (CBS-16) – Regional Basic Observing Network concept, and of Resolution 2 (EC-68) – Plan for the WMO Integrated Global Observing System pre-operational phase 2016–2019. Rationale is based on the need to integrate the Regional Basic Synoptic Network (RBSN) and the Regional Basic Climatological Network (RBCN) into the future Regional Basic Observing Network (RBON) and include additional observing stations into the RBON in order to reflect its multi-disciplinary nature in support of all WMO application areas. RBON will lead to improved services by delivering more and improved observations to stakeholders, and enable the full benefit of regional observing capabilities to be realized. It is foreseen that RBON will be established by Cg-18, and the standards and recommendations for implementation of the RBON will be incorporated into a new edition of the Manual on the WMO Integrated Global Observing System (WMO-No. 1160) in 2019. Pending formal establishment of RBON, this Decision is meant to facilitate transition from RBSN and RBCN to the future RBON through a pilot project. The stations/platforms currently comprising the RBSN and RBCN are the primary candidates for the RBON, and are expected to constitute the backbone of the RBON.

Decision RA VI-17/15

Regional Association VI (Europe) requests Members to commit to GCOS requirements for GSN and GUAN, in terms of availability, content and quality to ensure that climate stations meet the minimum requirements of reporting monthly CLIMAT messages and radiosonde soundings from GUAN stations of up to 30hPa height levels.

See the annex to the present decision and RA VI-17/INF. 3.2(3).

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Decision justification: The operators of GSN stations are encouraged to fully meet the GCOS Monitoring Principles for observation and for data exchange for all surface ECVs. The GSN data can be analysed to yield basic indicators of the global climate system and also provide benchmark locations for higher-density local, regional and national networks. The WMO WWW/GOS surface synoptic observing network provides the major in situ observations of the following ECVs: Temperature, Air pressure, Precipitation, Water vapour, Surface radiation (e.g. sunshine duration, solar irradiance) and Wind speed and Direction. Included in this network is the global baseline GSN. It is important to note that, as part of the regional implementation of WIGOS, a new Regional Basic Observing Network (RBON) concept is being introduced to replace and expand on the capabilities of the existing Regional Basic Synoptic Network (RBSN) and Regional Basic Climatological Networks (RBCN).

The value of GUAN regularly attaining set heights, regular ascents or remote observations can be demonstrated by NWP and reanalysis centres. Radiosondes have the biggest impact on weather forecasts following satellite data. Radiosonde data is also needed for satellite calibration.

Decision RA VI-17/16

Regional Association VI (Europe) urges Members to support the GCOS Cooperation Mechanism as an efficient mean to improve climate stations and to assist with the coordination of individual national efforts.

See the annex to the present decision and RA VI-17/INF. 3.2(3).

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Decision justification: The GCOS Cooperation Mechanism aims to help develop the capacity of countries to perform climate observations. It is supported by a designated Network Manager who administers a dedicated trust fund and uses the WMO procurement process to swiftly execute projects to renovate climate stations and improve climate observing systems.

Decision RA VI-17/17

Regional Association VI (Europe) encourages Members to activate national GCOS coordinators, designated by the relevant division at national governmental level responsible for the coordination of climate observation, who will provide regular reports and assesses progress made in national coordination in compliance with the coordinator’s responsibilities; and who establishes a national climate observations inventory.

See the annex to the present decision and RA VI-17/INF. 3.2(3).

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Decision justification: A national GCOS coordinator will coordinate the planning and implementation of systematic climate observing systems across the many national departments and agencies involved with their provision, and in doing so will contribute to the national commitments made to WMO resolutions and UNFCCC decisions.

Annex to Decisions RA VI-17/14 to 17

GLOBAL CLIMATE OBSERVING SYSTEM – REGIONAL IMPLEMENTATION TO ADDRESS CLIMATE MONITORING NEEDS

1. GCOS Implementation Plan

Regional Workshops

1.1 Following the publication of the Implementation Plan, "The Global System for Climate: Implementation Needs (GCOS-200)", GCOS activities have been guided by the actions presented in the plan. As part of the general actions GCOS will hold regional workshops, particularly in light of the importance of adaptation, to identify needs and potential regional cooperation. The regional work programme envisaged would be an ideal forum to discuss adaption needs, promote guidance and best practice and design projects to improve observational networks.

1.2 These workshops will result in regional plans that will highlight the greatest needs and benefits of the proposed observational improvements. Donors would be encouraged to address these needs, either through the GCOS Coordination Mechanism, other actors or directly. As a follow-up, the output of the workshop will be submitted to the Regional Association for further considerations.

2. GCOS Network Management

Performance of GSN and GUAN

2.1 The GCOS Secretariat is reporting regularly on the GCOS Surface Network (GSN), the GCOS Upper-Air Network (GUAN) and the GCOS Cooperation Mechanism (GCM), including the station list update, monitoring statistics for past and current years and current and recent observations projects undertaken by the GCOS network management.

2.2 Whilst the majority of Region VI Members are providing the monthly CLIMAT message, there are still a few that are not. It is important to remind Members on their commitment in providing the monthly CLIMAT message both for their GSN and RBCN stations. Further, it is important to remind Members that radiosonde soundings will need to reach 30hPa height levels, and that there are still a few GUAN stations in RA VI which do not reach the required level.

3. GCOS Cooperation Mechanism

3.1 The GCOS Cooperation Mechanism (GCM) was established to address the high-priority needs for stable long-term funding for key elements of global climate observations. It is intended to address priority needs in atmospheric, oceanic and terrestrial observing systems for climate, including data rescue, analysis and archiving activities. It supports: equipping, managing, operating and maintaining observing networks; a range of data-management activities, such as data-quality

assurance, analysis and archiving; and a variety of applications of the data and products to societal issues. The project CATCOS (Capacity Building and Twinning of Climate Observing Systems) has been a contribution from Switzerland to the GCOS Cooperation Mechanism and focused on systematically gathering data and improving the use of climate relevant data in 10 developing countries.

3.2 Resources are limited so not all countries can be helped and priority should be given to a few sites that can address these observational gaps, which coincide with the aims of potential donors and for which sustainable arrangements are likely.

4. Activate national coordinators

4.1 Austria, Germany and Switzerland conduct regular coordination meetings at which national experts describe and assess progress made in national coordination of climate observing systems. All three Members have established and published national climate observations inventories, which can be found on the WMO website, on the GCOS page (https://public.wmo.int/en/programmes/global-climate-observing-system/), and which could serve as example to be followed by other Members.

Decision RA VI-17/18

Regional Association VI (Europe) decides:

(1) To request Members in the Arctic and mountain regions where cryosphere is present, seasonally or permanently, to contribute with additional existing stations to the Global Cryosphere Watch (GCW) observing network;*

(2) To organize in 2019, in collaboration with GCW and the Commission for Hydrology a workshop to address the cryosphere-related challenges (observations, data exchange, products, and the like) in the Eurasia region and interested neighbouring countries;

(3) To invite the Regional Association (RA) VI subsidiary bodies responsible for climate and hydrology, and the RA VI Regional Climate Centre (RCC) Network hosts to closely liaise with the concerned bodies of GCW and others, for example, Arctic Hydrological Observing System (Arctic HYCOS), to introduce cryospheric products into the RCC portfolio, and to invite GCW and its concerned bodies to be active contributors of information, advice and products to the RA VI RCC Network;**

(4) To invite the RA VI RCC Network to include operationally, as highly recommended functions, certain cryosphere forecast and analytical products recommended jointly by the Arctic PRCC-Network, under development, with criteria for and descriptions of the proposed products provided in collaboration with GCW;***

(5) To invite the RA VI RCC Network to actively collaborate with the new Arctic PRCC Network, during its demonstration phase and beyond, to share experience and foster consistency in products and approach;

(6) To invite GCW to contribute to and advise on cryosphere matters for the relevant RA VI statements on regional climate.

(7) RA VI requests the WMO to continue its leadership role on the further implementation of space based observations of the arctic and high mountain regions, including using high elliptical orbit satellites and emerging technologies such as nanosatellites, and to seeking funding opportunities through public private partnerships, including telecom partners.

(8) RA VI recognized the need to position the cryosphere observations and related services in the WMO information value chain and recommends that WMO strengthens its role in the coordination of the provision of services in arctic and high mountain regions, reflecting the importance of the cryosphere in the earth system model

For more information, see RA VI-17/INF. 3.2(7).

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Decision justification:

* Decision 45 (EC-69) – Development and implementation of the Global Cryosphere Watch, recognized the need to ensure that sustained observations of the cryosphere (snow, glacier, permafrost, sea ice, and the like) are available globally to support the derivation of authoritative advanced products (for example, systematic assessment of snowpack) and relevant value added services, such as flood forecasting and outlooks, water resource management, and climate avalanche services.

** Global Cryosphere Watch is an international mechanism to provide authoritative, clear and useable data, information and analyses on the past, current and future state of the cryosphere. Decision 46 (EC-69) – Development and implementation of the Arctic Polar Regional Climate Centre Network and of Polar Regional Climate Outlook Forums, endorsed the structure of the Arctic Polar Regional Climate Centre Network (Arctic PRCC Network) and requested Members to contribute to the functions of the Arctic PRCC Network as defined in the draft Implementation Plan of the Arctic PRCC Network. WMO was granted observer status at the Arctic Council at the Council's Tenth Ministerial Meeting (11 May 2017) and all the members of the Arctic Council are contributing to the Arctic PRCC Network activities.

*** The draft Implementation Plan of the Arctic PRCC Network acknowledges that Arctic-specific highly recommended products are required to address the needs of these regions. These products include seasonal snow-cover predictions, snow trackers, lake-ice or sea-ice products, products related to permafrost, glaciers, and the like, and would be introduced over time, in a phased-in approach to accommodate development of new products to meet user requirements in the region;

Decision RA VI-17/19

Regional Association VI (Europe) decides:

(1) To establish collaboration and coordination mechanisms to ensure the consistency and harmonization of Regional Climate Centre (RCC) operations within and beyond RA VI, through regular coordination efforts facilitated by the RA VI subsidiary body in charge of climate services[8];

(2) To assess on a regular basis the utilization of RCC products and services by the Members through establishing feedback mechanisms using Regional Climate Outlook Forums (RCOFs) and National Climate Outlook Forums (NCOFs), to share the assessment among RCCs, and to revisit the RA VI RCC-Network Operational Plan to further improve functions and operations, based on the feedback[9];

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[8] Some RCCs in RAs I, II and IV, including the proposed Arctic Polar RCC-Network, have overlapping domains of interest with the RCC operations in RA VI.

[9] Resolution 3 (RA VI-16) – Regional Climate Centre Network in Regional Association VI (Europe) promotes two-way communication between the RA VI RCC-Network and the NMHSs of RA VI, to

(3) To support the development and implementation of the Arctic PRCC-Network and the Pan-Arctic Regional Climate Outlook Forum (PARCOF) in close collaboration with RAs II and IV[10];

Notes:

(1) The draft Operational Plan of the RA VI RCC-Network, that was developed as a follow up to the WMO RA VI Workshop on RCC Implementation (October 2016, Belgrade, Serbia), and authorizes the RA VI Management Group to review and endorse it for implementation;

(2) The Annual Bulletin on the Climate in RA VI being regularly issued by the RA VI RCC-Network;

Invites:

(1) Members participating in and/or coordinating RCOFs to follow up on the outcomes of the International Workshop on Global RCOF Review and to implement recommendations of the Workshop towards more objective approaches to the provision of seasonal forecasts based on dynamical or empirical models, or a combination thereof, amenable to independent verification, a greater diversification of RCOF products, and a steady integration of seasonal forecasts in decision-making processes at country level;

(2) WMO RCCs and RCOFs serving RA VI Members to be closely engaged with the Copernicus Climate Change Service (C3S), and identify their potential roles in assisting the NMHSs to optimally utilize the emerging C3S products and services as complementary to those provided by the WMO RA VI RCC-Network[11];

Requests:

(1) The RA VI subsidiary body responsible for climate services to:

(a) coordinate and facilitate RCC/RCC-Network operations, in particular in the context of C3S emergence, and also to actively support the implementation of the Arctic PRCC-Network in close collaboration with the concerned entities of the Executive Council panel of experts on Polar and High-mountain Observations, Research and Services (EC-PHORS), Commission for Climatology (CCl) and Commission for Basic Systems (CBS)[12];

(b) explore the feasibility of, and to initiate producing, a regular Annual Statement on the Status of Regional Climate in RA VI targeting the general public and policy makers and highlighting key headline indicators, such as temperature, precipitation, cryosphere, sea level, major droughts and floods, and other high-impact extreme events, including wildfires, given that such a regional scale annual climate

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ensure effective uptake of RCC products and also to enhance national inputs and user feedback, and urges RA VI RCC-Network to actively support the development and operation of RCOFs in the region.

[10] Decision 52 (EC-68) – Polar Regional Climate Centres, endorsed the development of Arctic PRCC-Network as a joint initiative of RAs II, IV, and VI and a follow-up process to develop an implementation plan. Decision 46 (EC-69) – Development and implementation of the Arctic Polar Regional Climate Centre Network and of Polar Regional Climate Outlook Forums, provided additional guidance on the matter.

[11] The consolidated action plan for the development and deployment of the Climate Services Toolkit, endorsed by Decision 16 (EC-69) – Deployment of the Climate Services Toolkit, includes coordination with relevant international activities, such as the Copernicus Climate Change Service (C3S).

[12] Also see Decision RA VI-17/18 and RA VI-17/INF. 3.2(7).

assessment will add value to WMO climate monitoring by providing coherent synthesis of the behaviour of such indicators across the region[13];

(2) The Secretary-General

(a) to facilitate the coordination and provide the necessary secretariat support for implementing RCCs and RCC-Networks as stipulated in this decision, including through support for resource mobilization efforts,

(b) to engage with the Arctic Council and its Programmes seeking to achieve well-maintained and sustained observation networks and continuous monitoring in the Arctic, and pursue similar engagements regarding Arctic research and services within the framework of the Polar Predictions Project, the Arctic PRCC-Network, and other emerging opportunities.

For more information, see RA VI-17/INF. 3.3(1).

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Decision justification: This decision is aimed to consolidate and enhance RCC operations in RA VI, including close liaison with other similar regional initiatives within and around the region, to ensure comprehensive and complementary regional support to Members' climate services as well as to promote optimal utilization of RCC products and services. It also covers other key activities of RCCs such as RCOFs and regional climate monitoring products.

Decision RA VI-17/20

Regional Association VI (Europe) decides:

(1) To consider the regional representative of RA VI in the CAS Management Group as a crucial point of contact to the WMO research programmes and to task the regional representative to represent the agreed priorities of the region, promote the interaction of RA VI with the WMO research programmes for mutual benefit*, in particular in the context of implementing the principles towards better integrated research and development support to Members**. This will be further supported by the formation of a more inclusive CAS Management Group, comprising leading scientists from universities, independent research institutes, governmental research institutes, including NMHSs, and industry, representatives of funding agencies, as well as regional representatives and chairs of GAW, WWRP, WGNE and WCRP***.

(2) To urge the President of RA VI to ensuring the appropriate space for research related topics during RA VI sessions and meetings being inspired by a co-designed approach along the weather enterprise value chain.

(3) To ask RA VI members to give their representative in the CAS MG clear indication of their needs regarding research in meteorological, climatological and hydrological areas, guided by the priorities for RA VI.

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[13] Decision 25 (EC-68) – Strengthening WMO climate monitoring and assessment, invites Members to actively support WMO climate system monitoring with high-quality and timely climate data, information.

Decision justification:

* Decision 61 (EC-68) – World Weather Research Programme Implementation Plan for the period 2016–2023, and Decision 62 (EC-68) – Global Atmosphere Watch Implementation Plan for the period 2016–2023, both programmes being overseen by CAS, endorsed the draft implementation plans of the respective programmes which are built on the "Science for Service" concept.

** Decision 50 (EC-69) – An integrated research and development approach, endorsed the principles towards better integrated research and development support to Members, filling the gap between research and operations, and Recommendation 1 (CAS-17) – The role of science in serving society, calls Cg-18 to enable WMO research to be better integrated and more closely coordinated across weather, climate, water and related environment domains in order to provide the necessary scientific and technical advances which are needed to address the growing need for targeted and societally relevant services. This should be done in a seamless approach, in order to create an attractive environment in which NMHSs, academic institutions, the private sector and end users engage in research to their mutual benefit.

*** Successfully linking research to service delivery, including the development of seamless prediction capabilities, requires utilization of the capabilities of a much larger science community than only those in National Meteorological and Hydrological Services (NMHSs). The World Climate Research Programme (WCRP) and programmes of the Commission for Atmospheric Sciences (WWRP, GAW) draw on the capabilities of the larger science community beyond from NMHSs already. It is also necessary to engage with the private sector and funding agencies to share and expand on resources which enable future research activities. A better link to and partnerships with the science community beyond NMHS will enable the utilization of the full capabilities of the science community for advancing the WMO Strategy for Service Delivery.

Decision RA VI-17/21

Regional Association VI (Europe) decides to support scale up WMO resource mobilization efforts, in particular through tapping technical and financial resources provided by the European Union (EU), International Financial Institutions and climate finance mechanisms to strengthen the National Meteorological and Hydrological Services (NMHSs) infrastructure, capacity, and service delivery.

NMHSs from countries providing Official Development Assistance (ODA) will continue to support resource mobilization efforts to finance and implement projects and encourage those who are not doing so to engage.

Decision justification: RA VI represents a diverse group of WMO Members at different stages of development. Within RA VI, the European Union (EU) is a defining entity, with RA VI countries as EU member states, accession countries, and neighbourhood countries. All RA VI countries have access to financing from International Financial Institutions (IFI), including the European Investment Bank, and most countries benefit from World Bank Group financing and/or knowledge and advisory services. Several RA VI countries are eligible to access international climate finance mechanisms, including from the Green Climate Fund, as well as concessional finance provided through multilateral and bilateral development banks and institutions.
RA VI countries are encouraged to fully take advantage of these financial and technical resources provided by the EU, IFIs, and climate finance mechanisms to strengthen their NMHS

infrastructure, capacity, and their service delivery, including multi-hazard early warning systems and climate services.

The need to scale up resource mobilization efforts is driven by rapidly increasing demand for weather, climate, and water services and the corresponding ambition to close the capacity gap(draft Strategic Objective 4, WMO Strategic Plan 2020–2023). The opportunities for scaled-up resource mobilization are also increasing, given the substantial flow of concessional climate and development finance to strengthen delivery of weather, climate and water services.

In order best tap these opportunities, going forward, WMO Secretariat and RA VI members will join efforts to scale up the provision of (i) WMO technical expertise, including on a cost-recovery basis, to those international partners that are financing projects and programmes to strengthen NMHS; and (ii) advice to developing country Members on strengthening evidence-based policy decision-making as well as o preparing projects with their national and regional institutions, including those accredited to the Green Climate Fund and the Adaptation Fund.

Decision RA VI-17/22

Regional Association VI (Europe) requests:

(1) The Secretary General to take into account the outcomes and recommendations of the Regional Conference, held prior to this RA VI session, in formulating the WMO–wide priorities 2020–2023 as a contribution to the WMO Strategic Plan 2020–2023[14] and initiate the process to develop the WMO-wide Operating Plan 2020–2023[15] with clear actions, timelines and indicators for Regional Association, Technical Commissions and the Secretariat;

(2) The president, in consultation with the Management Group and Permanent Representatives of RA VI Members, to develop the RA VI Regional Operating Plan 2020–2023, through identification of deliverables and activities with due account of the outcomes and recommendations of the Regional Conference, held prior to this RA VI session, and thus provide inputs to the WMO-wide Operating Plan 2020–2023.

Decision justification: The above Decision supports the WMO Executive Council request addressed to its Working Group on Strategic and Operational Planning to refine the draft Strategic Plan 2020–2023 for further consideration by EC-70.

Decision RA VI-17/23

Regional Association VI (Europe) requests Members:

(1) To regularly update their profiles on the Country Profile Database (CPDB) and provide Monitoring and Evaluation (M&E) data, as needed;

(2) To review and, if not already assigned, designate M&E Focal Points, authorising them to:

    (a) Serve as liaison with the Secretariat on related issues;

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[14] Decision 65 (EC-69) – Preparation of WMO Strategic Plan 2020–2023

[15] Decision 66 (EC-69) – Outline of the Operating Plan and budget 2020–2023

(b) Facilitate the collection of monitoring data;

(c) Ensure timely, accurate, reliable and comprehensive performance information; and

(d) Participate in the continued development of current CPDB and implementation of the new CPDB, including training on the use and benefits of the new functionality for internal application.

Requests the Secretary-General to take measures aimed at facilitating the online update of CPDB directly by Members.

For more information, see RA VI-17/INF. 4.1(3).

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Decision justification: Monitoring and evaluation is an essential activity within any business and benefits from being able to compare one's own national profile with other organizations for benchmarking and for prioritizing internal activities and resources.

The WMO M&E System is contingent upon Members' provision of timely and accurate monitoring data. Just as within any NMHS, comprehensive monitoring information is required to measure performance in implementation of the WMO Strategic and Operating Plans both for WMO and WMO's development partners. Complete and reliable monitoring data facilitates decision-making, informs strategic planning, and assists in resource mobilization. The new data collection process will be more efficient and the data more accurate being based on M&E Focal Points at the national level. In addition to reducing the number of surveys and data collection requests to Members, NMHSs will be able to use this information as an internal tool comparing national status with the regional and global community.

APPENDIX 4. RECOMMENDATIONS ADOPTED BY THE SESSION

Recommendation 1 (RA VI-17)

REPORTS

REGIONAL ASSOCIATION VI (EUROPE),

Noting with satisfaction the reports in RA VI-17/INF. 2.1 from the RA VI president, chairpersons and co-chairpersons of the RA VI working groups, the leader of the Task Team on the Regional Operating Plan, and the WMO Representative for Europe, describing the achieved deliverables and making recommendations for the next intersessional period,

Acknowledging the effective work of the RA VI president, Management Group, working groups and task teams,

Recognizing the Members' contribution towards the implementation of the RA VI Regional Operating Plan,

Encourages the Secretary-General, regional associations and technical commissions to engage further in the trans-regional activities and launch new initiatives that would lead to closer trans-regional cooperation;

Invites Members:

(1) To second their experts and interns to the Regional Office for Europe to support its work;

(2) To consider supporting the RA VI trust fund with voluntary contributions for the implementation of RA VI activities developed by the RA VI working bodies and endorsed by the RA VI Management Group.

Recommendation 2 (RA VI-17)

REVIEW OF THE GLOBAL DATA-PROCESSING AND FORECASTING SYSTEM IN REGIONAL ASSOCIATION VI

REGIONAL ASSOCIATION VI (EUROPE),

Recalling:

(1) Resolution 18 (EC-69) – Revised *Manual on the Global Data-processing and Forecasting System* (WMO-No. 485),

(2) That the revised *Manual on the Global Data-processing and Forecasting System* (WMO-No. 485) includes functional requirements for Global Data-processing and Forecasting System (GDPFS) centres,

(3) That the Executive Council at its sixty-ninth session agreed that the denomination of Regional Specialized Meteorological Centres (RSMCs) with geographical specialization be maintained until Eighteenth World Meteorological Congress in 2019, and that the RSMCs with geographical specialization that have not confirmed the mapping of their centres retain that status until then,

Noting that with the improved capability of some Member's National Meteorological and Hydrological Services and their enhanced capability in serving other Members, more and more Members are seeking the designation of World Meteorological Centre and/or RSMC for their centres,

Requests RA VI Members currently hosting a World Meteorological Centre, an RSMC with activity specialization and/or a Lead Centre that have confirmed the mapping of their centres onto the corresponding types of centre described in the revised *Manual on the Global Data-processing and Forecasting System* (WMO-No. 485), to complete the process to demonstrate compliance and retain their status according to the new designations by Eighteenth Congress in 2019;

Requests RA VI Members to regularly report on the use and quality of the GDPFS products and services within their countries and territories to the WMO Secretariat, who in turn will summarize the feedback and inform the GDPFS centres for the improvement of the system;

Recommends the Commission for Basic Systems:

(1) To revise the *Guide on the Global Data-processing System* (WMO-No. 305) to ensure the necessary alignment with, and provide further guidance to Members for, the implementation of the revised *Manual on the Global Data-processing and Forecasting System* (WMO-No. 485);

(2) To develop performance requirements for monitoring GDPFS centres and assist RA VI in the audit process of its GDPFS centres, in coordination with the Commission for Basic Systems Expert Team on Centre Audit/Certification.

Recommendation 3 (RA VI-17)

WMO REGIONAL TRAINING CENTRES AND COLLABORATION ON EDUCATION AND TRAINING ACTIVITIES IN REGIONAL ASSOCIATION VI

REGIONAL ASSOCIATION VI (EUROPE),

Recalling:

(1) Decision 54 (EC-69) – Identification of priorities for education and training,

(2) Decision 56 (EC-69) – WMO Regional Training Centres,

(3) Decision 58 (EC-69) – WMO volunteers,

Noting:

(1) The commitment of its Members to support national training institutions with a view to strengthening cooperation in the Region and beyond, by dedicating WMO Regional Training Centres (RTCs) in Israel, Italy, the Russian Federation and Turkey in support of various WMO education and training initiatives, including the interest expressed by Ukraine to offer its Hydrometeorological Institute of the Odessa State Environmental University to support the Region (see RA VI-17/INF. 3.5(1)),

(2) The activities of the European Meteorological Services Network (EUMETNET) Working Group on Education and Training in developing an approach to enhance regional collaboration on education and training matters (see RA VI-17/INF. 3.5(3)),

(3) The outcome of the Thirteenth WMO Symposium on Education and Training held in Barbados, from 30 October to 1 November 2017, and the report of the meeting of the directors of WMO RTCs held on 2 November 2017 (see RA VI-17/INF. 3.5(2)),

Having considered the need to leverage further resources and foster partnerships for enhancement of WMO capacity development activities,

Endorses the request of the Spanish State Meteorological Agency (see RA VI-17/INF. 3.5(5)) to be designated as a WMO RTC;

Recommends that the Executive Council approve the Spanish State Meteorological Agency's request at its seventieth session;

Endorses the WMO Volunteers and WMO Global Campus initiatives as ways of enhancing the exchange of experts, training resources and collaboration between Members and Regions, the EUMETNET Education and Training Programme being worthy of note as it provides significant European support and input to the WMO Global Campus;

Recommends that the WMO RTCs in Israel, Italy, the Russian Federation and Turkey continue in their designation as RTCs until the next opportunity for external review by the Executive Council Panel of Experts on Education and Training and the subsequent Executive Council decision;

Recommends that WMO RTCs be proactive in conducting training for National Meteorological and Hydrological Services in new areas of service delivery, including impact-based forecast and warning services, air quality, data management, hydrological prediction and water resources, utilization of the global prediction system, management development and other new priority areas.

APPENDIX 5. LIST OF PARTICIPANTS

1. Officers of the session

Ivan CACIC	President

2. WMO Members within RA VI

Austria

Michael STAUDINGER	Principal Delegate

Belarus

Maria GERMENCHUK (Ms)	Principal Delegate
Irina DIVAKOVA (Ms)	Delegate

Belgium

Daniel GELLENS	Principal Delegate
Marc HEIRMAN	Delegate

Bosnia and Herzegovina

Almir BIJEDIC	Delegate
Zoran BOZOVIC	Delegate
Igor KOVACIC	Delegate
Mirjana STOLICA (Ms)	Delegate

Croatia

Ivan CACIC	Principal Delegate
Branka IVANCAN PICEK (Ms)	Alternate
Ines ŠPREM SCIGLIANO (Ms)	Delegate
Igor CIZMEK	Delegate
Kreso PANDZIC	Delegate
Borivoj TEREK	Delegate

Cyprus

Kleanthis NICOLAIDES	Principal Delegate

Czechia

Jan DANHELKA	Principal Delegate
Petr MARTINEK	Delegate
Karel VANCURA	Delegate

Denmark

Marianne THYRRING (Ms)	Principal Delegate
Anne Højer SIMONSEN (Ms)	Alternate

Estonia

Taimar ALA	Principal Delegate
Kristina UIBOPUU (Ms)	Delegate

Finland

Juhani DAMSKI	Principal Delegate
Maria HURTOLA (Ms)	Delegate

Harri PIETARILA	Delegate
Tarja RIIHISAARI (Ms)	Delegate

France

Catherine BORRETTI (Ms)	Delegate
Laurence FRACHON (Ms)	Delegate
Jean-Marc LACAVE	Delegate
Bernard STRAUSS	Delegate

Georgia

Ramaz CHITANAVA	Principal Delegate
Irakli MEGRELIDZE	Delegate

Germany

Gerhard ADRIAN	Principal Delegate
Axel THOMALLA	Alternate
Ingeborg DETTBARN (Ms)	Delegate
Karolin EICHLER (Ms)	Delegate

Greece

Nikolaos VOGIATZIS	Principal Delegate
Konstantina MITA (Ms)	Delegate

Hungary

Kornélia RADICS (Ms)	Principal Delegate
Eszter LABO (Ms)	Alternate

Iceland

Arni SNORRASON	Principal Delegate

Ireland

Eoin MORAN	Principal Delegate
Sarah O'REILLY (Ms)	Alternate
Gerald FLEMING	Delegate

Israel

Nir STAV	Principal Delegate
Dan ZAFRIR	Delegate

Italy

Silvio CAU	Principal Delegate
Carlo CACCIAMANI	Delegate
Angela Chiara CORINA (Ms)	Delegate
Umberto DOSSELLI	Delegate

Kazakhstan

Bekaidar SARY	Delegate
Gulzhan TULEBAYEVA (Ms)	Delegate

Lebanon

Marc WEHAIBE	Principal Delegate

Lithuania

Saulius BALYS	Delegate

Luxembourg

Andrew FERRONE	Principal Delegate

Montenegro

Luka MITROVIC	Principal Delegate

Netherlands

Gerard VAN DER STEENHOVEN	Principal Delegate
Hans ROOZEKRANS	Delegate

Norway

Roar SKÅLIN	Principal Delegate
Morten JOHNSRUD	Alternate
Camilla HUSUM VOLD (Ms)	Delegate

Poland

Tomasz WALCZYKIEWICZ	Principal Delegate
Janusz FILIPIAK	Delegate
Jacek TRZOSOWSKI	Delegate

Portugal

Jorge Miguel MIRANDA	Principal Delegate

Republic of Moldova

Valeriu CAZAC	Principal Delegate
Marin CEBOTARI	Delegate
Diana LESAN (Ms)	Delegate

Romania

Elena MATEESCU (Ms)	Principal Delegate

Russian Federation

Maxim YAKOVENKO	Principal Delegate
Alexander NURULLAEV	Alternate
Alexander GUSEV	Delegate
Dmitry KIKTEV	Delegate
Marina PETROVA (Ms)	Delegate

Serbia

Jugoslav NIKOLIC	Principal Delegate
Milica ARSIC (Ms)	Delegate
Danko JOVANOVIC	Delegate
Vladislav MLADENOVIC	Delegate
Goran PEJANOVIC	Delegate

Slovakia

Martin BENKO	Principal Delegate

Branislav CHVILA	Delegate
Jozef CSAPLÁR	Delegate
Jana POÓROVÁ (Ms)	Delegate

Slovenia

Klemen BERGANT	Delegate
Drago GROSELJ	Delegate

Spain

Carmen RUS JIMENEZ (Ms)	Alternate
Julio GONZALEZ BRENA	Delegate
Jose Pablo ORTIZ DE GALISTEO M.	Delegate
Ernesto RODRIGUEZ CAMINO	Delegate

Sweden

Rolf BRENNERFELT	Principal Delegate
Ilmar KARRO	Alternate
Cristina ALIONTE EKLUND (Ms)	Delegate

Switzerland

Manuel KELLER	Alternate
Manuela BIZZOZZERO (Ms)	Delegate
Oliver HOEHNE	Delegate
Nicolas LANZA	Delegate
Olivier OVERNEY	Delegate
Susanne ROSENKRANZ (Ms)	Delegate
Peter BINDER	President

The former Yugoslav Republic of Macedonia

Ivica TODOROVSKI	Principal Delegate
Nina ALEKSOVSKA (Ms)	Delegate

Turkey

Ismail GUNES	Principal Delegate
Ercan BUYUKBAS	Delegate

Ukraine

Mykola KULBIDA	Principal Delegate
Oleg SKOROPAD	Delegate

United Kingdom of Great Britain and Northern Ireland

Robert VARLEY	Principal Delegate
Jane WARDLE (Ms)	Alternate
Harry DIXON	Delegate
Aileen SEMPLE (Ms)	Delegate
Felicity WORSFOLD (Ms)	Delegate

3. WMO Members outside RA VI

Burundi

Philippe MINANI	Observer
Renovat TABU	Observer

United States of America

Susan WEST (Ms)	Observer

4. Invited experts

Jeremy TANDY

5. Representatives of international organizations and other bodies

European Centre for Medium-range Weather Forecasts (ECMWF)

Erik ANDERSSON	Observer

Economic interest grouping of National Meteorological and Hydrological Services in Europe (ECOMET)

William A. MCCAIRNS	Observer

European Meteorological Services Network (EUMETNET)

Eric PETERMANN	Observer

European Organization for the Exploitation of Meteorological Satellites (EUMETSAT)

Christophe Jean JACOB	Observer

World Bank

Daniel KULL	Observer

6. WMO Secretariat

Heather AUCOIN (Ms)	Observer
David GRIMES	President

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