Policy on the Exchange of Hydrological and Meteorological Data, Information, Forecasts and Advisories under the South-East European Multi-Hazard Early Warning Advisory System (SEE-MHEWS-A)

Policy on the Exchange of Hydrological and Meteorological Data, Information, Forecasts and Advisories under the South-East European Multi-Hazard Early Warning Advisory System (SEE-MHEWS-A)

THE SIGNATORIES TO THIS POLICY (hereinafter: Signatories),

Recognizing the vital importance to strengthen regional and sub-regional cooperation and national and regional capacities in provision of meteorological, hydrological and marine forecasts, advisories and warnings, through the establishment of a regional framework for improved multi-hazard transboundary early warning advisory services, as well as transboundary communication and collaboration among National Meteorological and Hydrological Services (NMHS), by leveraging existing regional capabilities and resources where possible;

Building on positive experience of the International Sava River Basin Commission, which adopted a data policy, based on Resolution 25 (Cg-XIII) with a focus on the exchange of hydrological data;

Considering the need to identify and where possible mitigate gaps in observing networks in South-East Europe, and foster an open exchange of meteorological, hydrological and marine observational data with improved spatial and temporal resolution for the purpose of the regional advisory system;

Recalling the purpose of the SEE-MHEWS-A System to provide advisories of meteorological and hydrological conditions to NMHSs for their provision of information and services to disaster risk management authorities;

Considering the SEE-MHEWS-A Implementation Plan as a basis for the development of the technical part of the regional advisory system, and for all activities necessary to establish advisory system operations;

Aware of the ongoing developments of the Global Multi-Hazard Alert System (GMAS) Framework and related WMO Coordination Mechanism, to be led by new technical commissions, and the recognition of the SEE-MHEWS-A as a GMAS RA VI pilot sub-regional activity, as agreed by the Eighteenth World Meteorological Congress (Cg-18);

HAVE AGREED as follows:

MEANING OF THE TERMS

South-East European Multi-Hazard Early Warning Advisory System (SEE-MHEWS-A): SEE-MHEWS-A is a framework for enhanced service delivery implemented through improvements in meteorological, hydrological and marine forecasting by strengthened modelling capabilities, nowcasting, ICT infrastructure and data provision and exchange. SEE-MHEWS-A does not replace the existing national or regional early warning systems (EWS), but provides a structure supporting the evolution of these systems, which will continue to be owned and operated by a diverse array of organizations and programmes. SEE-MHEWS-A will provide information to meteorological, hydrological and marine forecasters to enable them to better respond to the weather-related natural hazards within their national EWSs. To address the limited resources within the SEE region, SEE-MHEWS-A will focus on improved sub-regional collaboration and joint operations of some of the functions within the advisory system.

SEE-MHEWS-A Project Steering Committee (PSC): Project Steering Committee is composed of the Permanent Representatives with WMO (PRs) and/or Directors of meteorological, hydrological and hydrometeorological services of WMO Member states. PSC is chaired by the President of WMO Regional Association VI (Europe). PSC is a governing body of the project and collective owner of the SEE-MHEWS-A System.

SEE-MHEWS-A Project Policy Advisory Group (PPAG): PPAG is an advisory body to the Project Steering Committee composed of the selected PRs and/or Directors of meteorological, hydrological and hydrometeorological services of the WMO Member states from South-East Europe. PPAG supports PSC in overseeing and monitoring the project implementation, addressing coordination and cooperation issues, covering all relevant policy aspects of the collaboration between the WMO Member states participating in the project, and in relation to other contributing stakeholders (ECMWF, EUMETNET, EUMETSAT, etc.).

Technical Teams of SEE-MHEWS-A (TTs): Established by the Project Steering Committee to represent SEE sub-regional expertise in different areas. TTs are composed of experts from SEE, contributing stakeholders, and other invited experts. Following are the established Technical Teams: *Forecasting and Nowcasting (TT-FNC); Numerical Weather Prediction (TT-NWP); Hydrology (TT-HYDRO); Observations (TT-OBS); Information and Communication Technology (TT-ICT).*

SEE-MHEWS-A Data Manager: Dedicated expert(s) working under the TT-OBS providing support in managing the Centralized Observational Database (CODB). Supported by the European Centre for Medium-Range Weather Forecasts (ECMWF), SEE-MHEWS-A Data Manager will ensure the implementation of this data policy on the technology level.

Products of the SEE-MHEWS-A: Outputs of collaborative activities performed under the SEE-MHEWS-A.

Input Data to the SEE-MHEWS-A: Observational data, national Numerical Weather Prediction (NWP) products and tools, etc. that Signatories contribute to the SEE-MHEWS-A.

Common Information Platform (CIP): A secure ICT platform for dissemination and visualization of data, model outputs, and other post-processed products for the SEE-MHEWS-A system.

Centralized Observational Database (CODB): Database allowing access to observations, and supporting the utilization of meteorological, hydrological and marine/oceanographic models, their verification, calibration of hydrological models and further post-processing.

Primary Signatories: Primary signatories to the Policy are the NMHSs from WMO Member States of the SEE region.

Contributing (Additional) Signatories: Other organizations responsible for the collection and/or management and distribution of hydrological and meteorological data, information, forecasts, or advisories. These organizations may become an Additional Signatory to the Policy on the invitation of the relevant Primary Signatory.

Global Multi-Hazard Alert System (GMAS): GMAS is a system under development and is expected to be the WMO framework for substantially increasing and enhancing the availability of, and access to, authoritative warnings and information related to high-impact weather, water and climate events at all levels.

South-East Europe (SEE): In the context of this Policy South-East Europe covers the Balkans, part of the Central and Eastern Europe, Turkey and the Middle East. All countries participating in the SEE-MHEWS-A are WMO Member states from WMO Regional Association VI (Europe).

World Meteorological Organization (WMO): WMO is a specialized agency of the United Nations (UN) with 193 Member States and Territories. It is the UN system's authoritative voice on the state and behaviour of the Earth's atmosphere, its interaction with the land and oceans, the weather and climate it produces and the resulting distribution of water resources.

European Centre for Medium-Range Weather Forecasts (ECMWF): ECMWF is both a research institute and a 24/7 operational service, producing global numerical weather predictions and other data for its Member and Co-operating States and the broader community. The Centre has one of the largest supercomputer facilities and meteorological data archives in the world. The ECMWF strategic activities include delivering advanced training and assisting the WMO in implementing its programmes.

1. CONTEXT

1.1 Exchange of hydrological and meteorological data, information, forecasts, and advisories under the SEE-MHEWS-A is vital for the development, implementation, and functioning of the sub-regional early warning advisory system.

1.2 Through Resolution 40 (Cg-XII) - Policy and Practice for the Exchange of Meteorological and Related Data and Products, Resolution 25 (Cg-XIII) - Exchange of Hydrological Data and Products, and Resolution 60 (Cg-XVII) - WMO Policy for the International Exchange of Climate Data and Products to Support the Implementation of the Global Framework for Climate Services, WMO encourages its Members to provide on a free and unrestricted basis[1] those meteorological and hydrological data and products, which are necessary for the provision of services in support of the protection of life and property and for the well-being of all people. Above resolutions recognise the right of Governments to choose the manner by which, and the extent to which they make data and products available domestically and internationally.

1.3 The legal statutes regarding the collection and exchange of hydrological and meteorological data and information of the SEE Governments differ; international cooperation on this matter within the SEE region provides benefits to all Signatories. In this regard, the Signatories will, within the constraints of their Governments' legal statutes, comply with the principles and practices detailed in this Policy.

1.4 Through the regular exchange of data, information, forecasts, and advisories as outlined in this Policy, the Signatories will take steps toward the improved provision of early warnings in the SEE region.

1.5 Close cooperation between NMHSs and other organizations (such as water management agencies, hydropower plant companies, radar operators, etc.), responsible for the collection and/or management and distribution of hydrological and meteorological data, information, forecasts, or advisories is a key towards improved early warning services in the region.

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[1] "Free and unrestricted" means non-discriminatory and without charge. "Without charge", in the context of this resolution means at no more than the cost of reproduction and delivery, without charge for the data and the product themselves.

2. OBJECTIVES OF THE POLICY

2.1 This Policy provides the technical and conceptual principles required to promote data, information, forecast, and warning exchange and interoperability within the SEE region. Establishment of this Policy should facilitate the access and dissemination of relevant hydrological and meteorological data, information, forecasts, and advisories exclusively for the purpose of the SEE-MHEWS advisory system unless agreed otherwise by the Signatories.

2.2 This Policy is intended to provide a framework within which additional observational data is exchanged for the purpose of numerical weather prediction data assimilation, hydrological modelling, and verification, within the SEE-MHEWS advisory system. The resulting information, forecasts and advisories are to be shared among the Signatories.

2.3 Estimates of discharge calculated by the System are not intended for water resource apportionment purposes as the System has currently not been designed for this. This system should not be used for national or transboundary water apportionment applications.

3. SPECIAL ROLE OF ECMWF AS A SIGNATORY

3.1 ECMWF is a SEE-MHEWS-A Contributing stakeholder which will provide technical expertise on observations and data management, numerical weather prediction and hydrological modelling components of the South-East European Multi-Hazard Early Warning Advisory System. ECMWF will provide support to SEE-MHEWS-A expert team in various activities during the pilot/demonstration (pre-operational) phase of the project based on the availability of financial resources.

3.2 The ECMWF involvement in SEE-MHEWS-A comprise the following:

- Provide their operational data collection and processing tools to serve as a SEE-MHEWS-A CODB, and support the SEE-MHEWS-A data manager to customize it according to this Policy, during the pre-operational phase;
- Perform its routine data quality control on additional data received from project participants;
- Support NMHSs in setting-up their limited area models (ALADIN, COSMO, NMM-B) nested in the ECMWF global NWP model;
- Support the SEE-MHEWS external consultant in the design and implementation of Common Information Platform (CIP) that will be installed and run at ECMWF infrastructure;
- Support SEE-MHEWS external consultants in installing the selected hydrological model(s) in an IT environment of ECMWF given that they follow the code and software standards of ECMWF;
- Support the SEE-MHEWS external consultant in recalibrating Lisflood model used in European Flood Awareness System (EFAS) specifically for the region and evaluating results over pilot catchments for which the project countries have provided quality controlled hydrological data for possible further improvements of the European Flood Awareness System (EFAS);
- Support the external consultants in setting up the modelling chain of NWP and hydrological models, including global ECMWF model and LAM models over the selected catchment(s) to run in near real-time;
- Support the external consultants to perform verification of the cascading forecasting system for selected river catchment(s).

3.3 ECMWF will provide a secure IT environment for the implementation of the SEE-MHEWS-A system.

3.4 ECMWF will participate in hands-on training workshops in the SEE region to apply the LISFLOOD output to particular river catchments.

3.5 ECMWF will contribute to building partnerships between NMHSs and Disaster Risk Management (DRM) agencies in utilization of flood forecasting products. Contribute with the advice to joint analysis of newly developed flood forecasting products at national meetings, which will be performed on a regular basis.

4. MONITORING LOCATIONS AND OBSERVATIONAL DATA

4.1 The agreement to exchange data under the terms of this Policy covers the following types of observations, collected by the Signatories:

- For hydrological observations: The variables listed in WMO RRR Requirements Database (OSCAR/Requirements) under the application area "Hydrology";
- For atmospheric observations: The variables listed in WMO RRR Requirements Database (OSCAR/Requirements) under the application area "High Resolution NWP".

4.2 The minimum level of data exchange deemed essential for the SEE-MHEWS-A shall be as follows:

- For hydrological observations: Data at horizontal and temporal resolution meeting at least the *threshold requirement* listed for the relevant variable in WMO RRR Requirements Database (OSCAR/Requirements) under the application area "Hydrology";
- For meteorological observations: Data at horizontal and temporal resolution meeting at least the *threshold requirement* listed for the relevant variable in WMO RRR Requirements Database (OSCAR/Requirements) under the application area "High Resolution NWP".

4.3 It is recognized that not all Signatories may be making all relevant observations at all their sites at the present time. Where such data are not currently available, the relevant Signatory will endeavour to extend their monitoring and/or data processing programmes in order to supply such data and/or information in the future.

4.4 Data and information should be transferred to ECMWF in a format mutually agreed by the SEE-MHEWS-A technical teams and ECMWF, following the WMO standards to the extent possible.

4.5 The monitoring locations covered by this Policy should, in principle, include all observation stations operated by the Signatories. The Signatories are encouraged to approach other operators of meteorological and hydrological networks in their countries to obtain additional quality-controlled data if feasible.

5. METADATA

5.1 Appropriate metadata should be provided for any data or information exchanged under this Policy, in particular detailing the measurement method and describing the quality and reliability of the data, and any access restrictions that may apply.

5.2 The metadata to be provided should be mutually agreed by the PSC and should include, but not be limited to the information specified in the *WMO Technical Regulations* (WMO-No. 49).

5.3 The WMO OSCAR/Surface database will serve as a reference source of information about the observing systems covered under this policy. All observing stations and platforms covered under the Policy must be registered and identified as SEE-MHEWS-A assets in OSCAR/Surface by the respective Signatory, and their metadata must be complete and kept up to date (updated at least annually).

6. DATA QUALITY AND MEASUREMENT STANDARD

6.1 Through the use of quality control procedures, Signatories agree to make an effort to maintain and improve the quality and consistency of data and information being transferred under this Policy.

6.2 Where data and information is exchanged that has not undergone quality control and is considered to be provisional, the Signatories will inform SEE-MHEWS-A data manager, and WMO during the transfer of the data.

6.3 ECMWF will perform its routine data quality control on the transferred data, and in case of data quality incident inform the SEE-MHEWS-A data manager.

6.4 Appropriate use of data and information exchanged under this Policy is the responsibility of the Signatories. The providers of the data accept no liability for any loss or damage, cost or claims arising directly or indirectly from their use.

7. FORECASTS AND ADVISORIES

7.1 The Signatories will, within their capacities, jointly develop and implement a suite of meteorological, hydrological and marine/oceanographic prediction models, coupled or not, to be operated in an IT infrastructure suitable for SEE-MHEWS System.

7.2 In performing the action from 6.1, Signatories will be assisted in the pre-operational phase by ECMWF. The infrastructure of the ECMWF will be used to develop and test the methodology applied, including the performance of numerous case-study tests, and if applicable, semi-regular operations.

7.3 The forecasts data and products produced by the models operated under SEE-MHEWS-A will be made available in all relevant formats, including binary, to all Signatories in the Common Information Platform (CIP), which, during the pre-operational phase, will be installed at ECMWF. Verification results of the forecast data and products will also be available to all Signatories.

7.4 Warnings and advisories produced by Signatories, responsible at the national level, based on the data, information and forecasts shared within the context of SEE-MHEWS-A, will also be made available in the CIP for cross-border harmonization purposes, when needed.

8. ACCESS RIGHTS AND STORAGE OF INPUT DATA AND PRODUCTS

8.1 The observational data that will be stored in the CODB shall strictly follow this Policy. Each Signatory can restrict access to their own data by informing the PSC, according to which access rights/restrictions to the CODB shall be granted by the SEE-MHEWS-A data manager.

8.2 ECMWF will provide their operational data collection and processing tools and support to the SEE-MHEWS-A data manager to customize it according to this Policy, during the pre-operational phase.

8.3 Conditions for the access to the products by Additional Signatories will be determined on the national level with relevant Primary Signatory.

9. CONDITIONS OF USE OF INPUT DATA AND PRODUCTS

9.1 Input data to the SEE-MHEWS-A, including observational data, exchanged under this Policy shall be used exclusively for the purpose of the SEE-MHEWS advisory system unless agreed otherwise by the providers.

9.2 Products of the SEE-MHEWS-A shall be used exclusively for the official duty purposes in connection to activities related to warnings production.

9.3 Additional quality controlled data obtained in line with clause 3.5, shall be treated under the same conditions as the input data referred to in clause 7.1.

10. OWNERSHIP AND ACKNOWLEDGEMENT

10.1 Ownership of the input data to the SEE-MHEWS-A remains the property of the providers.

10.2 Products of the SEE-MHEWS-A are jointly owned by the Signatories.

10.3 When using the products and/or input data acknowledgement will be given to SEE-MHEWS-A and/or data providers.

11. FUTURE HARMONIZATION OF DATA AND INFORMATION

11.1 The Signatories agree to work together, through the SEE-MHEWS-A, to further standardize the collection and management of the data and information covered by the Policy, taking advantage of all relevant WMO regulatory material. It is expected that this will include inter alia, where possible, harmonization of data measurement methods, units of observation, transfer formats, and metadata.

12. DISPUTES

12.1 If a dispute arises between two or more Signatories about the interpretation or implementation of this Policy, they should seek a solution by negotiation among the parties, overseen by the PSC Chair, and assisted by the WMO Secretariat.

13. COME INTO EFFECT

13.1 This Policy will come into effect upon acceptance by the Signatories and have an initial duration of five years, and will thereafter be automatically renewed for further consecutive periods of five years unless it is terminated.

14. CHANGES TO THE POLICY

14.1 Changes to this Policy may be proposed by any Primary Signatory and must be agreed and signed by all Signatories.

15. SIGNATORIES

15.1 The Primary Signatories to this Policy are the NMHSs from the WMO Member states of the SEE region, responsible for issuing warnings on national level.

15.2 Other organizations responsible for the collection and/or management and distribution of hydrological and meteorological data, information, forecasts, or advisories may become Additional Signatories on the invitation of the Primary Signatory.

15.3 Relationship between the Primary and Additional Signatories from selected country is arranged at the national level, including its potential termination.

15.4 The relevant Primary Signatory shall inform other Signatories in case of accession or withdrawal of Additional Signatory.

16. TERMINATION AND WITHDRAWAL

16.1 This Policy may be terminated by mutual agreement of all Signatories.

16.2 Any Signatory to this Policy may withdraw from this Policy by giving at least 90 days written notice to other Signatories.

17. OTHER

17.1 The Policy does not affect arrangements for the exchange of data and information between the Signatories provided by other bilateral or multilateral agreements.

17.2 The Policy shall be deposited at the WMO Secretariat. In faith whereof duly authorized representatives have signed this Policy on behalf of their respective institutions listed in the Annex A. This Policy is signed in a single copy, in English, which shall remain deposited in the archives of WMO, and certified true copies of which shall be delivered to all Signatories.

Signatures
by the representatives of National Meteorological and Hydrological Services

	Signature	Date and place
Director of IGEWE, Albania	Fatos Hoxhaj	Tirane 5.12.2019
Director of FHMZ-FBIH, Bosnia and Herzegovina	Almir Bijedic	TEL AVIV 05.11.2019.
Director of RHMZ-RS, Bosnia and Herzegovina	Tomislav Šajić	T. AVIV 05.11 2019.
Director General of NIMH, Bulgaria	Hristomir Branzov	
Director General of DHMZ, Republic of Croatia	Branka Ivančan-Picek	Tel Aviv 5.11.2019.
Director of DoM, Cyprus	Kleanthis Nicolaides	
Director of WDD, Cyprus	Charalambos Hajipakkos	
Director General of HNMS, Greece	Nikolaos Vogiatzis	Tel Aviv 5.11.2019
President of OMSZ, Hungary	Dr. Kornélia Radics	Tel Aviv. 5.11.2019
Director of IMS, Israel	Nir Stav	Tel Aviv 5.11.19
Director of IHS, Israel	Guy Reshef	
Director of JMD, Jordan	Hussein EL-MOMANI	Amman 6-11-2019

Signatures
by the representatives of National Meteorological and Hydrological Services

	Signature	Date and place
Director of IGEWE, Albania	..... Fatos Hoxhaj	.....
Director of FHMZ-FBIH, Bosnia and Herzegovina	..... Almir Bijedic	.....
Director of RHMZ-RS, Bosnia and Herzegovina	..... Tomislav Šajić	.....
Director General of NIMH, Bulgaria	..... Hristomir Branzov	.....
Director General of DHMZ, Republic of Croatia	..... Branka Ivančan-Picek	.....
Director of DoM, Cyprus	..... Kleanthis Nicolaides	NICOSIA 19/6/20
Director of WDD, Cyprus	..... Charalambos Hajipakkos	.....
Director General of HNMS, Greece	..... Nikolaos Vogiatzis	.....
President of OMSZ, Hungary	..... Dr. Kornélia Radics	.....
Director of IMS, Israel	..... Nir Stav	.....
Director of IHS, Israel	..... Guy Reshef	.....
Director of JMD, Jordan	..... Hussein EL-MOMANI	.....

Director of LMD, Lebanon ....
Marc Wehaïbé

Director of IHMS, Montenegro ..... Tel Aviv 5.11.2019
Luka Mitrovic

Representative of SHS, Republic of Moldova ..... Tel Aviv 5.11.2019
Lidia Trescilo
(according to the Letter of Commitment from the Director on 10th October 2019)

Director of UHMR, Republic of North Macedonia ..... TEL AVIV 5.11.2019
Ivica Todorovski

Director General of NMA RO, Romania ..... TEL AVIV 5.11.2019
Elena Mateescu

Director of NIHWM, Romania ....
Nicolae Barbieru

Director of Meteorology and Hydrology Office, ARSO, Republic of Slovenia ..... Tel Aviv 5.11.2019
Klemen Bergant

Director General of TSMS, Republic of Turkey ....
Volkan Mutlu Coşkun

Director of UHMC, Ukraine ..... TEL AVIV 05.11.2019
Mykola Kulbida

Signature
by the representative of European Centre for Medium-Range Weather Forecasts

Director General of ECMWF ..... Tel Aviv 5/11/2019
Florence Rabier

ANNEX
SIGNATORIES TO THE POLICY

Institution	Country	Abbreviation
Institute of Geosciences, Energy, Water and Environment	Albania	IGEWE
Federal Hydrometeorological Institute	Bosnia and Herzegovina	FHMZ-FBIH
Hydrometeorological Service of the Republic of Srpska	Bosnia and Herzegovina	RHMZ-RS
National Institute of Meteorology and Hydrology	Bulgaria	NIMH
Croatian Meteorological and Hydrological Service	Republic of Croatia	DHMZ
Department of Meteorology	Cyprus	DoM
Water Development Department (WDD)	Cyprus	WDD
Hellenic National Meteorological Service	Greece	HNMS
Hungarian Meteorological Service	Hungary	OMSZ
Meteorological Service	Israel	IMS
Israel Hydrological Service, Governmental Authority for Water and Sewage	Israel	IHS
Meteorological Department	Jordan	JMD
Lebanese Meteorological Department	Lebanon	LMD
Institute of Hydrometeorology and Seismology	Montenegro	IHMS
State Hydrometeorological Service	Republic of Moldova	SHS

Institution	Country	Abbreviation
Hydrometeorological Service	Republic of North Macedonia	UHMR
National Meteorological Administration	Romania	NMA RO
National Institute of Hydrology and Water Management	Romania	NIHWM
Slovenian Environment Agency	Republic of Slovenia	ARSO
State Meteorological Service	Republic of Turkey	TSMS
Ukrainian Hydrometeorological Centre	Ukraine	UHMC

Special Signatory to the SEE-MHEWS-A Data Policy

European Centre for Medium-Range Weather Forecasts		ECMWF