WMO OMM
World Meteorological Organization
Organisation météorologique mondiale
Organización Meteorológica Mundial
Всемирная метеорологическая организация
المنظمة العالمية للأرصاد الجوية
世界气象组织

WEATHER CLIMATE WATER
TEMPS CLIMAT EAU

1950-2025
SCIENCE for ACTION

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Ref.: 08668/2025-L8 PPE

文件编号： 08668/2025/ASG/PPE　　2025 年 7 月 10 日

附件： 1（仅以英文提供）

主题： 对题为“WMO 呼吁所有利益相关方合作开发人工智能(AI)和机器学习(ML)环境监测与预测技术、工具与应用”的大会声明草案提供意见

要求采取的行动： 于 **2025 年 7 月 25 日前**为该 WMO 呼吁草案提供意见

尊敬的先生/女士，

我谨通知您，执行理事会第七十九次届会核可了建议 3(4.1/2)(EC-79)，即建议大会通过“WMO 呼吁所有利益相关方合作开发人工智能(AI)和机器学习(ML)环境监测与预测技术、工具与应用”声明，详见附件。

该 WMO 呼吁旨在宣布：WMO 将与各利益相关方协作，通过应用 AI/ML 技术，通过加强天气、气候、水和环境相关服务的整个价值链，满足全球各种需求。换言之，该 WMO 呼吁意在利用令人振奋的 AI/ML 技术进步，提速多利益相关方合作。

根据这项建议，我谨提请 WMO 会员关注该 WMO 呼吁草案，并为进一步丰富其内容征求您的素材。此外，我们同时还在与积极参与 AI/ML 开发的国际气象组织和公司以及水文气象与环境产业协会(HMEI)及其成员进行类似的磋商。由于时间有限，仅附上经 EC-79 批准的 WMO 呼吁的英文草案。经批准的其他 WMO 正式语言版本经翻译后将立即上传 EC-79 网站，但这一过程可能需要一些时间。

在您对所附的 WMO 呼吁草案提供的意见中，应考虑到可能促进 AI 和 ML 在天气、气候、水文、海洋及相关环境服务中应用的基本原则、利益相关者的观点以及近期可能开展 AI 和 ML 合作的意愿。秘书处将汇编所有意见，供政策咨询委员会采用，以完善 WMO 呼吁草案，并通过主席提交将于 10 月举行的 2025 年大会特别会议(Cg-Ext(2025))审议并通过。

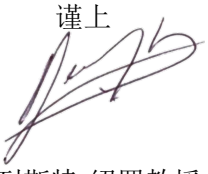
致： WMO 会员常任代表

抄送：水文顾问

请审查所附的 WMO 呼吁草稿，并以英文提供您的反馈。若条件允许，我谨建议您在提交意见前，收集贵国或领地的非政府部门(如私营部门和学术部门以及民间社会)的意见。请于 **2025 年 7 月 25 日前**将您的答复发送至 WMO 秘书处公共私营参与办公室(ppe@wmo.int)。若您有任何问题或需要更多信息，请与我们联系。

我谨借此机会，感谢您和贵国家气象水文部门（NMHS）对促进 WMO 活动的一贯支持。

谨上



席列斯特·绍罗教授
秘书长

Ref.: 08668/2025-L8 PPE

DRAFT WMO CALL TO ALL STAKEHOLDERS

TO COLLABORATE ON THE DEVELOPMENT OF ARTIFICIAL INTELLIGENCE (AI) AND MACHINE LEARNING (ML) ENVIRONMENTAL MONITORING AND PREDICTION TECHNOLOGIES, TOOLS AND APPLICATIONS

Ref.: 08668/2025-L8 PPE

We, the delegates from 1XX Member States and Territories of the World Meteorological Organization (WMO), meeting in Geneva from 20 to 23 October 2025 at the Extraordinary Session of the World Meteorological Congress,

Having considered that the application of rapidly advancing cutting-edge artificial intelligence (AI) and machine learning (ML) technologies can contribute to the further reduction of global societal risks related to extreme weather, climate, hydrological, marine and related environmental events by combining with existing well-honed scientific methodologies and databases developed over decades,

Call for collaborative action of public, private and academic sectors to meet the need for sustainable development, the reduction of loss of life and property caused by natural hazards and other catastrophic events related to weather, climate, hydrological, marine and related environmental events, as being forged ahead by the United Nations Early Warnings for All initiative, as well as safeguarding the environment and the global climate for the survival of present and future generations of humankind, **by enhancing and leveraging the application of AI/ML technologies to environmental prediction systems**.

We note:

(1) The record-breaking rainfall and flooding, rapidly intensifying tropical cyclones, deadly heat, relentless drought and raging wildfires that have occurred recently in different parts of the world are unfortunately part of current reality and may be a foretaste of our future;

(2) That reducing risks from such extreme phenomena in the short, mid- and long term will benefit from the use of state-of-the-art technologies in addition to scientific findings, consistent with the stated aim of the United Nations Early Warnings for All initiative;

We further note the rapid progress in AI/ML technologies, which can not only build on, enhance, and be combined with such well-honed scientific methodologies and databases developed for decades but also significantly improve our collective ability to generate decision-supporting data, products and services for governments, businesses and citizens;

We recognize:

(1) The need to further strengthen the entire weather, climate, hydrological, marine and related environmental services value chain – from acquisition and exchange of observations and information through to data processing, nowcasting and forecasting, and service delivery, including early warnings provided by National Meteorological and Hydrological Services (NMHSs) as the authoritative voice, and the underpinning research, education and training – to collectively meet growing societal needs;

(2) That in order to realize the opportunities that AI/ML offers for all weather, climate, hydrological, marine and related environmental services – the datasets that enable these advances and their applications need to remain open and accessible for all to benefit;

(3) The evolving AI/ML-related capabilities of the public, private and academic sectors contributing to all links of the value chain and accelerating operational innovation in NMHSs;

(4) That WMO is already piloting, and many Members are already conducting research and development activities on using AI/ML across the entire value chain of meteorological and hydrological services;

(5) That AI/ML can contribute to the value chain from observations to service provision and decision-making, including helping to resolve some of the long-standing capacity development challenges faced by developing countries, in particular, Least Developed Countries (LDCs) and Small Island Developing States (SIDS) in the meteorological, climate, hydrological, marine and environment-related domains;

We welcome the opportunities presented by today's rapid advances in AI/ML, which have great potential to complement existing efforts, fill gaps, and accelerate progress as WMO and its Members seek to increase their efforts in enhancing early warning systems;

We call for:

(1) Collaborative action and engagement on AI among the public sector, private sector, academic sector and other partners in the global weather enterprise building on the principles declared in the Geneva Declaration – 2019: Building community for Weather, Climate and Water Actions and the ethical principles captured in the Code of Ethics concluded between WMO and HMEI;

(2) Action to ensure that AI/ML-related open principles, such as the open science policy[1], open data policies (e.g. those of WMO[2] and its Members and the FAIR (Findable, Accessible, Interoperable, and Reusable) Data Principles[3]), and open sharing of AI/ML-based models, tools and data, are maintained to enable unbiased, global support such that all countries, inclusive of developing countries, can define and implement their own forecast and impact sector interactions, in line with existing national and/or regional mandates on the protection of life and property;

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1 An international framework for open science policy and practice is provided in the UNESCO Recommendation on Open Science adopted by the General Conference of the United Nations Educational, Scientific and Cultural Organization (UNESCO), meeting in Paris, from 9 to 24 November 2021. recognizes disciplinary and regional differences in open science perspectives, takes into account academic freedom, gender-transformative approaches and the specific challenges of scientists and other open science actors in different countries and in particular in developing countries, and contributes to reducing the digital, technological and knowledge divides existing between and within countries at its forty-first session. This Recommendation outlines a common definition, shared values, principles and standards for open science at the international level and proposes a set of actions conducive to a fair and equitable operationalization of open science for all at the individual, institutional, national, regional and international levels.

2 Resolution 1 (Cg-Ext(2021)) – WMO Unified Policy for the International Exchange of Earth System Data

3 Wilkinson, M., Dumontier, M., Aalbersberg, I. et al. The FAIR Guiding Principles for scientific data management and stewardship. Sci Data 3, 160018 (2016). https://doi.org/10.1038/sdata.2016.18; "a concise and measurable set of principles that we refer to as the FAIR Data Principles. The intent is that these may act as a guideline for those wishing to enhance the reusability of their data holdings." "the FAIR Principles put specific emphasis on enhancing the ability of machines to automatically find and use the data, in addition to supporting its reuse by individuals"

(3) A proactive response to open calls to be made primarily through the permanent representatives of WMO Members and/or the WMO Secretariat, related to the collaboration on AI and ML and other applications of innovative technologies, including those for:

   (a) Participation in scientific and technical considerations and studies conducted by WMO Members and WMO technical expert teams; and

   (b) Contributing to WMO capacity development activities, e.g. pilot studies and demonstration projects to assist WMO Members, especially those that have gaps in fulfilling their mission in developing countries, in particular, LDCs and SIDS, aiming at closing the digital divide to allow services based on the latest science and technology worldwide;

(4) Joining the discussion in the WMO-led dialogue platform, the Open Consultative Platform (OCP), to coordinate and streamline a high-level dialogue between the sectors and nurture collaboration and innovation for the new generation of weather and climate intelligence embracing new information and technology across the whole value chain and enabling greater benefits for society;

We reaffirm and call on all partners to give due considerations to:

(1) The mission of WMO outlined under Article 2 of the WMO Convention as to facilitate worldwide cooperation on monitoring and predicting changes in weather, climate, water and other environmental conditions through the exchange of information and services, standardization, application, research and training;

(2) The roles of WMO in:

   (a) Developing and promulgating international standards to ensure the quality, interoperability and fit-for-purpose information and services,

   (b) Promoting the adherence by all stakeholders to those standards, which have enabled global international data exchange that has largely contributed to, for example, AI/ML-based weather and hydrological analysis and prediction, and

(3) The vital importance of the national mission of NMHSs in monitoring, understanding and predicting weather, climate and water, and in providing early warnings and other services as the authoritative voice of the country;

(4) The commitment of WMO Members to implement and enhance the free and unrestricted exchange of Earth system data and products as articulated in Resolution 1 adopted at Cg-Ext(2021), and to enable access to the international data infrastructure and facilities coordinated by WMO, which data have underpinned and will continue to underpin directly or indirectly the rapid progress and further development/improvement in most of the AI-based weather/hydrological prediction models and other AI/ML-related applications;

(5) The responsibility and continued efforts of WMO Members and of the global and regional WMO data centres to maintain, sustain and enhance requisite infrastructure and the operation of domestic and international systems and facilities for observations, data exchange, data processing/prediction and information supply; This includes government investment in core public infrastructure and capability, which directly/indirectly underpins stakeholders' weather, climate, water and other environment-related activities utilizing AI/ML;

We urge all stakeholders from public, private and academic sectors to collectively continue to advance the global public good by:

(1) Enabling all countries to advance together by providing AI-related support, including education and training opportunities, to bridge gaps in the service delivery of NMHSs particularly in developing countries, in particular, LDCs and SIDS;

(2) Respecting the sovereign right of WMO Members to organize and provide weather, climate, hydrological, marine and related environmental services according to their national legislation and policies for sharing prediction products, while noting the significant variation in legislative and institutional frameworks concerning meteorological and hydrological services between countries. This includes among other regulations governing early warnings, observations, forecasts and information dissemination;

(3) Ensuring proper attribution for NMHSs as data and information sources in these activities;

(4) Engaging in a cross-sectoral dialogue to establish appropriate principles of mutually beneficial cooperation and discuss legislative and/or institutional arrangements to enable AI/ML-related effective cross-sector partnerships and remove barriers to collaboration, reflecting the principles in the Geneva Declaration – 2019.

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