Conference Statement

AI for Weather Prediction: Advances, Challenges and Future Outlook

9-11 September, Abu Dhabi, United Arab Emirates

The WMO AI Conference, convened by WMO and hosted by the United Arab Emirates National Center of Meteorology, brought together experts and representatives from across research institutions, national meteorological agencies and industry, each bringing their own unique capabilities, to discuss opportunities to build an AI ecosystem for global good.

The convergence of AI and meteorology is already rapidly transforming the community and provides the opportunity to spread the benefits of advanced prediction capabilities more equitably. It is recognized that AI will form an integral part of the future of weather, climate and hydrological prediction, and the conference participants expressed their enthusiasm at the opportunity to advance this together.

The participants affirmed their shared commitment to fostering collaboration in the development and deployment of AI-powered applications. At the heart of this commitment lies a shared vision: that AI should be applied to save lives and enhance livelihoods, with shared benefits for all.

The global meteorological community must invest in shared, open data and tooling, coordinated open benchmarks, and human-centered service design. This approach will ensure that AI tools are not only powerful, but also trusted, transparent, interoperable and tailored to the needs of diverse users—including those currently underserved by early warning systems. Existing technical and capacity development frameworks should be leveraged to rapidly build global capability.

The conference emphasized that investment in capacity development is essential and must meet members at their current levels of capacity and capabilities. Training programs, access to local data, use cases and open collaboration were identified as key enablers of sustainable capacity building. Exciting developments and pilot projects exploring the application of AI-based services should be shared as widely and as quickly as possible, with efforts particularly focusing on regionally based implementation, to narrow the digital divide and ensure long-term sustainability and shared benefit.

The conference reaffirmed the need to continue supporting and respecting the authoritative role of national meteorological and hydrological services in producing official warnings for the protection of life and property. Furthermore, participants emphasized the importance of maintaining public trust in early warning services. This trust is built on the credibility, transparency, and scientific rigor of official sources. Collaborative efforts must reinforce—not undermine—this trust.

The conference noted that trust is not a technical feature; it is the basis for adoption and collaboration, and must be underpinned by responsible innovation. Coordination and accountability must enable speed and scale. AI supporting the delivery of critical services must be auditable, adaptable and sustainable.

Recognizing that AI is built on the availability and accessibility of data, the conference acknowledged the need for an ongoing dialogue on public and private datasets to fully realize the opportunities afforded by AI. In addition, it highlighted the need for greater openness at the national level, in terms of additional observational and auxiliary data, to accelerate the development of higher resolution and impact-based services.

Participants emphasized that there is a critical need for the public sector to maintain high quality services and continue to develop tools to enrich AI training data sets. Furthermore, a successful transition to AI-enabled services requires continuing to support the current underlying observation infrastructure and physics-based systems

The conference expressed a strong interest in jointly developing a set of common principles to guide the responsible and effective integration of AI into meteorological, climate, hydrological and environmental services. These principles should be grounded in openness, reproducibility, transparency, collaboration, sustainability, innovation, and knowledge creation. They should serve as a foundation for ethical progress in the field. The conference also recognized that the business model needs to work for all participants.

The conference participants propose a continued dialogue at multiple levels – continued higher-level strategic consultation as well as increased representation of the private sector and academia in relevant WMO working structures.

The conference participants acknowledge the generosity of NCM in hosting the conference.