

## A Vision for Numerical Weather Prediction in 2030

### Main Messages and points for further discussion

In the inaugural Global Weather Enterprise Forum (GWEF) webinar, Professor Tim Palmer of Oxford University shared his vision on how Numerical Weather Prediction (NWP) should evolve in the years leading up to 2030 and hence what it should look like in 2030. This included initial-value predictions from timescales of hours to seasons ahead, focused on how NWP can better help save lives from increasingly extreme weather in those parts of the world where society is most vulnerable. Professor Palmer also discussed his vision of the way global ensemble forecast systems should develop and he addressed the question: *“How many global ensemble systems do we need worldwide?”*<sup>1</sup>

The presenter outlined his vision on how Numerical Weather Prediction (NWP) should evolve in the years leading up to 2030 and hence what it should look like in 2030, from initial-value predictions from timescales of hours to seasons ahead, focused on how NWP can better help save lives from increasingly extreme weather in those parts of the world where society is most vulnerable.

The main topic that triggered discussion was the feasibility of improved prediction, through; 1) high-resolution (1-3 km) global ensembles, particularly for improved prediction of extremes; and 2) downscaling through limited area models; and; 3) subsequently, enhancing forecast using local observations and “translating” NWP output per local needs. Application of Artificial Intelligence (AI) based algorithms was of high interest; all participants recognized the extensive AI experience in the private sector, which should be tapped for such downscaling/calibration work, and that the available computing capabilities allow us to pursue this path. The presenter, while noting the great potential of AI to improve efficiency and predictability, cautioned on the data-driven nature and tremendous amount of training data needed.

The presentation, followed by a discussion with three panellists and the audience, also touched upon the role of National Met Services and of forecasters in the National Meteorological and Hydrological Services (NMHSs) in the 2030s. The presenter suggested that, in the future, NMHSs’ forecasting services should be designed and provided to satisfy the needs identified through direct interactions with users. He also emphasized that institutional and national interest should not hinder the scientific development and use of breakthrough technologies/knowledge.

The presentation was followed by a panel discussion and Q&A session. The panellists were Professor Alan Thorpe, Ms Alice Soares, and Dr Lars Peter Riishojgaard.

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<sup>1</sup> The presenter presented this subject also to the World Meteorological Organization (WMO) through the White Paper on the “Future of Weather and Climate Forecasting”.