



## To be or not to be: The operationalisation of climate projections

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Climate projections are one of the few sources of climate information that does not have an operational status at the WMO level. This might look surprising given the key role that both global and regional climate projections play in many domains, from climate risk assessments to climate adaptation plans and mitigation policies. The efforts made by the CMIP and CORDEX initiatives are invaluable, but are often not secured at the individual institution level nor benefit from the support and funding lines that operational activities typically experience.

This situation is the result of the infrastructure, models, and experimental design of the climate projections to have developed in the research domain, even when performed by weather services, over the last two decades. The models and the simulations have been developed by an army of researchers, many of them young postdocs, using research funding and computational resources, and relying on best efforts to document and disseminate the resulting data. This is far from what is understood as an operational system, where continuity, service reliability, flexibility, and timely response are essential elements.

Discussions about how to evolve climate projections to an operational setting that is compatible with the necessary research-based developments have recently started. The approach adopted by CMIP to define the CMIP7 fast track as a way to produce quicker climate projections that respond to specific requirements is a good example. But the needs go beyond CMIP. Recent literature is illustrating the policy and socioeconomic context that requires a more flexible production of the climate projections. They illustrate the need to include the user requirements at the beginning of the process (both to get robust regional climate information for adaptation and to explore relevant mitigation trajectories), have available a software and hardware infrastructure that can respond to these requirements, and count on well-defined long-term procedures and governance to coordinate the efforts at the global level. Some of these discussions have taken place as part of the Earth Virtualization Engines (EVE) forum and are being demonstrated in the Destination Earth Digital Twin for Climate Adaptation (Climate DT).

This presentation will illustrate the requirements for the operationalisation of the climate projections, underpinned by a solid research effort, and the initial steps in this direction by Climate DT, including the role of the fast developments based on machine learning techniques. It will also discuss what it would take to complete this operationalisation challenge and how it could enter the WMO sphere, through both the WMO Integrated Processing and Prediction System (WIPPS) and the initiative to develop WMO guidelines on the use and interpretation of climate change projections.

