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## Where our science ambitions meet computing and data handling limitations

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As sub-seasonal to seasonal predictive skill is determined by all components relevant for weather and climate prediction, namely initial conditions, Earth-system model components and forcings, it can serve as a driver for joint developments across both communities. Such developments consist of both science and technology elements, and they become rather challenging when aiming for future convection resolving capability. Examples for science elements are fully coupled and seamless ensemble data assimilation and forecasting systems, diagnostic methods tracing the roots of model errors, or parameter optimisation to adjust uncertain variables in parameterisations and to define model uncertainty in ensembles. Eventually, advanced science can only be implemented through advanced technology, which is seriously affected by the lack of 'free' computational performance growth in the post-Moore's law era and by the unmanageable volume and diversity of big data. This talk aims to demonstrate which investment in computing, data handling technology and artificial intelligence is needed for realising the seamless weather and climate prediction system of the future.

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