



## The Forecast Skill Horizon

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In the past decade, ECMWF has improved substantially the model components and the algorithms used to estimate the initial and forecast states, expressed in terms of a probability distribution function (PDF) of earth-system states. Atmospheric processes have been made more realistic, and ocean processes, aerosols and chemical species have been included in the forecast model. These advances have led to the extension of ensemble-based, probabilistic predictions out to sub-seasonal and seasonal time ranges. How far ahead can we provide skilful forecasts? More precisely, if we consider phenomena with increasingly coarse scales (both spatially and temporally), how far ahead can we predict them? In this talk, these questions are addressed applying the forecast skill horizon framework to ECMWF ensemble forecasts. Results based on 1 year of forecasts indicate that the forecast skill horizon for instantaneous, grid-point fields is between 16–23 days, while it is considerably longer for time- and spatial-average fields. Forecast skill horizons longer than the 2 weeks, thought to be the limit up to twenty years ago, are now achievable thanks to major advances in numerical weather prediction. These aspects of predictability, and how ECMWF plans to further exploit them, will be discussed in this talk.