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On the impact of ensemble size on seasonal forecast skill

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Seasonal forecasts are inherently probabilistic predictions. The operational seasonal forecasts at ECMWF are now based on a large ensemble of 51 members for their global predictions. However, due to the high computational costs of running such coupled simulations, the ensemble size of the corresponding retrospective forecasts (hindcasts) is often much smaller than this which leads to some inconsistency between the forecasts and hindcasts. In this contribution we analyse the effect of the size of the hindcast ensemble on estimates of forecast skill. A 51-member hindcast ensemble for ECMWF's System 4 will be contrasted with smaller ensembles from the same model to study the effect of an increasing ensemble size on probabilistic forecast skill, in particular on reliability, for regions of high and low predictability. The results will have implications for the optimal design of seasonal forecasting systems.