



## Evaluating decadal hindcasts: why and how?

C. A. T. Ferro (1), T. E. Fricker (1), F. E. L. Otto (2), and E. B. Suckling (3)

(1) Exeter Climate Systems, University of Exeter, Exeter, United Kingdom (c.a.t.ferro@ex.ac.uk), (2) Environmental Change Institute, University of Oxford, Oxford, United Kingdom (friederike.otto@ouce.ox.ac.uk), (3) Centre for the Analysis of Time Series, London School of Economics, London, United Kingdom (e.suckling@lse.ac.uk)

Extrapolating the performance of historical climate forecasts and hindcasts can be a poor guide to the performance of future climate predictions. Nevertheless, historical predictions do contain useful information about future performance. We propose a new approach to using this information to form quantitative judgments about future performance, thereby making explicit our answer to the question "how good are climate predictions?". We also discuss how to extract this information by evaluating hindcasts. In particular, we show how measures of performance can be chosen to (1) avoid spurious skill arising from time trends, (2) provide a fair evaluation of ensemble forecasts, and (3) describe how performance varies with the timescale of the predicted quantity.