Supplementary material for

A spread-versus-error framework to reliably quantify the potential for subseasonal windows of opportunity

Philip Rupp[1], Jonas Spaeth[1,2], and Thomas Birner[1,3]

[1]Meteorological Institute Munich, Ludwig-Maximilians University (LMU), Munich, Germany
[2]Research Department, European Centre for Medium-Range Weather Forecasts (ECMWF), Bonn, Germany
[3]Deutsches Zentrum für Luft- und Raumfahrt (DLR), Institut für Physik der Atmosphäre, Oberpfaffenhofen, Germany

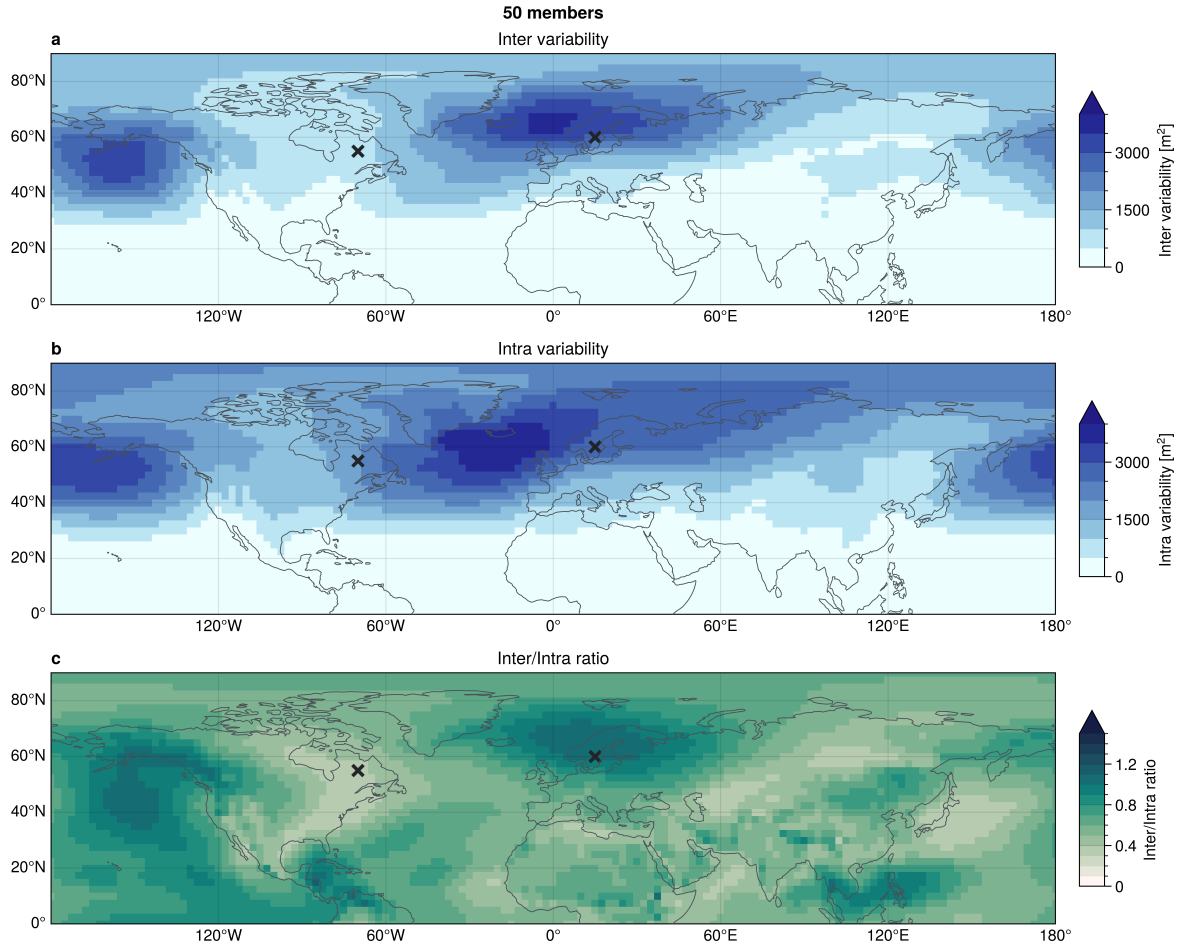

Figure S1: (a) Inter- and (b) intra-variability of z1000 ensemble variance for 50-member ensembles and the northern hemisphere. Inter-variability is computed as the standard deviation across different forecasts of subseasonal leadtime-averaged (days 14-46) ensemble variance, and intra-variability as standard deviation over subseasonal leadtimes of variance and then averaged over all forecasts. (c) shows the ratio of inter-over-intra variability. Crosses indicate locations in eastern Canada and northern Europe analysed in other Figures.

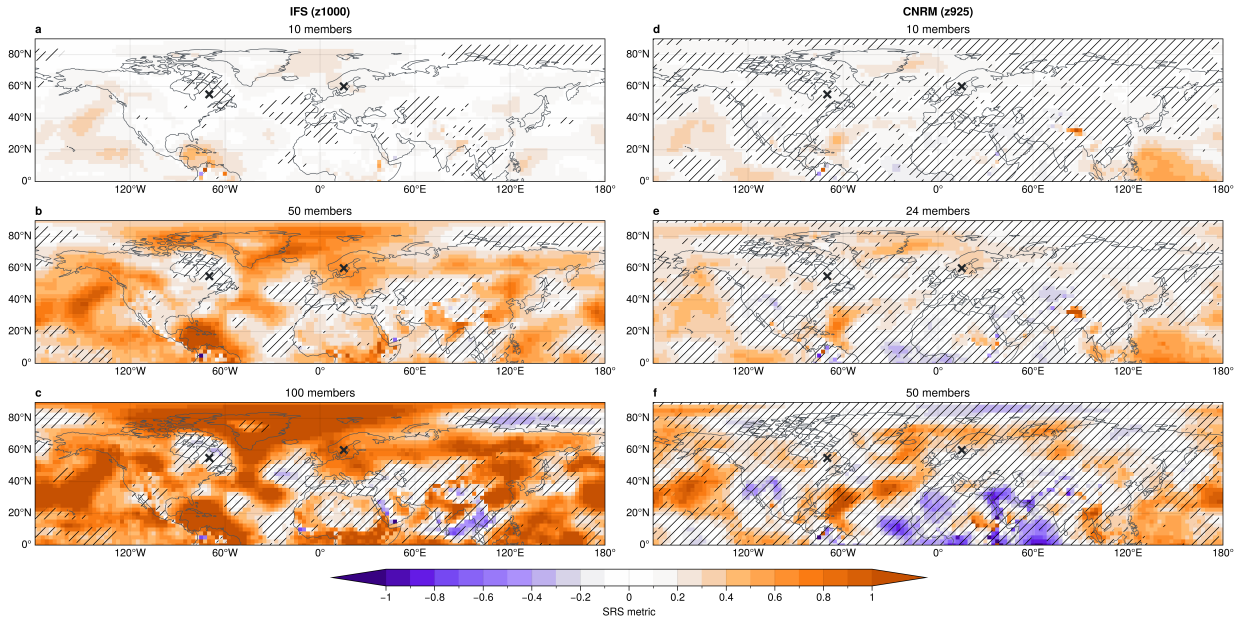

Figure S2: Comparison of *SRS* describing the spread-error slope between forecasts using the (a,b,c) IFS model and the CNRM model (d,e,f). Note that the panels show z1000 for IFS and z925 for CNRM. Different rows within a column show *SRS* for different ensemble sizes, although ensemble sizes differ between the two models. Hatched areas indicate regions where the *SRS* is not statistically different from zero at the 99% confidence level. Crosses indicate locations in eastern Canada and northern Europe analysed in other Figures.

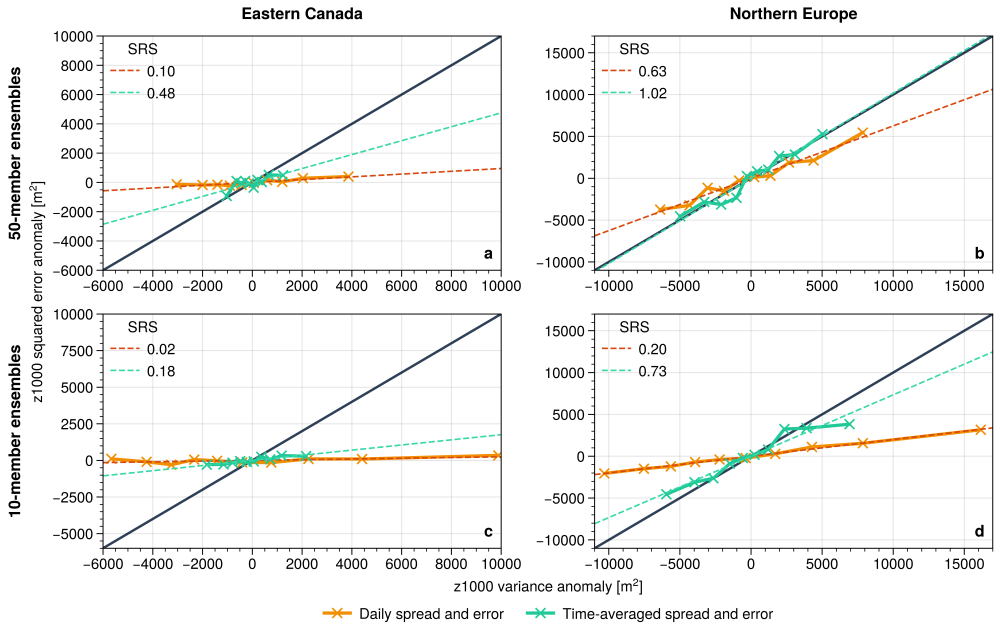

Figure S3: Comparison between reliability of daily spread values and spread averaged over subseasonal lead-times (days 14-46) at points in (a,c) eastern Canada (55°N/70°W) and (b,d) northern Europe (60°N/15°E). Top row shows reliability in 50-member ensembles, bottom row in 10-member ensembles. Numbers in the top-left corner of each panel indicate the *SRS*, describing the slopes of linear fits through the reliability curve.

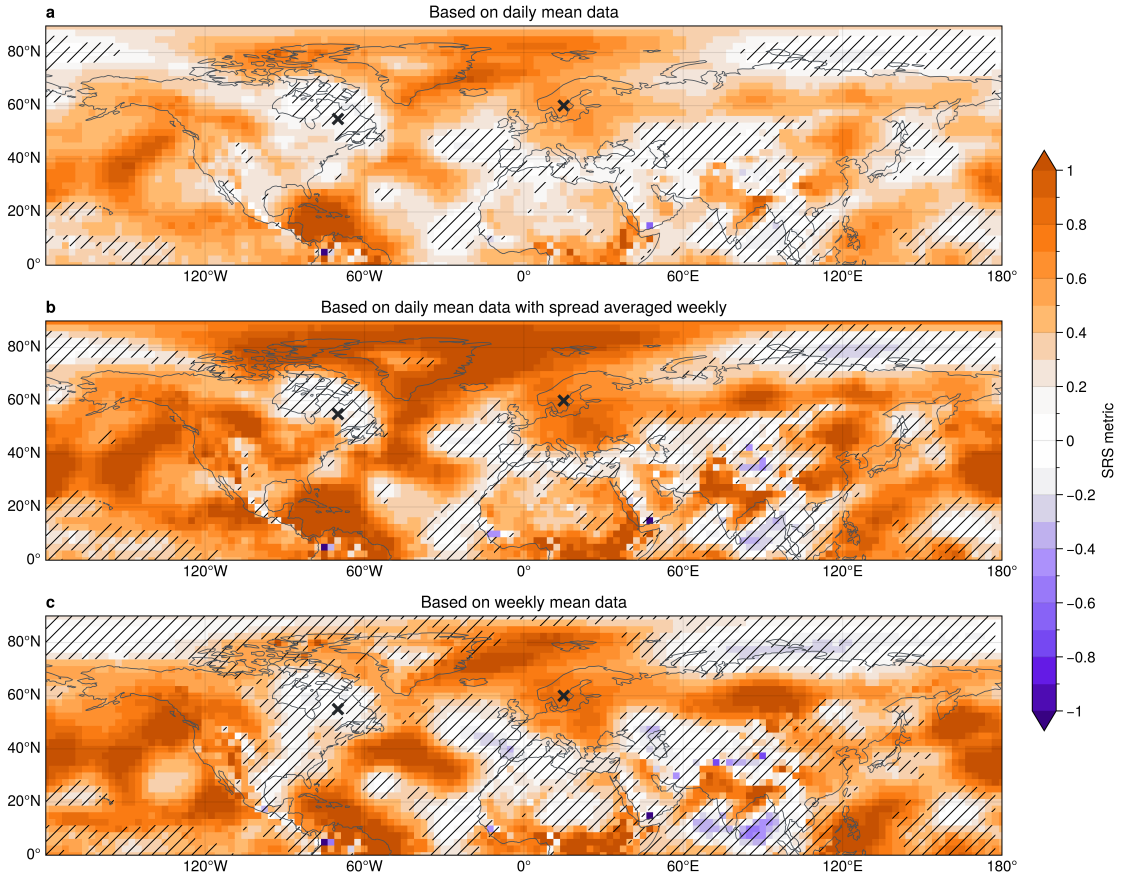

Figure S4: Northern hemisphere maps of SRS in 50-member ensembles. (a) shows SRS computed for spread based on daily data, (b) shows SRS computed from weekly-averaged spread based on daily data and (c) SRS for spread based on weekly data. Hatched areas indicate regions where the SRS is not statistically different from zero at the 99% confidence level. Crosses indicate locations in eastern Canada and northern Europe analysed in other Figures.