EMS Annual Meeting Abstracts
Vol. 15, EMS2018-186, 2018

Forecasting severe weather in the medium and extended ranges

Ivan Tsonevsky
ECMWF, Forecast Department, Reading, United Kingdom (ivan.tsonevsky@ecmwf.int)

The Extreme Forecast Index (EFI) has been developed at ECMWF as a measure of the difference between the ensemble forecast and the model climate (M-climate) Cumulative Distribution Functions. The closer the forecast values are to either end of the M-climate range the more abnormal the ensemble forecast is, and the greater the magnitude of the EFI (it ranges from -1 to +1). The EFI is usually used for forecasting severe weather assuming that if the forecast is extreme compared to the M-climate, the real weather is likely to be extreme as well. The Shift of Tails (SOT) has been designed to complement the EFI by providing information on the extremity of the tails of the forecast distributions. ECMWF provides operationally the EFI and SOT for a number of parameters such as temperature, wind and precipitation up to day 7, valid for 24-hour time intervals. There are also some longer range forecasts valid for 72 or 120-hour intervals up to day 15 of the forecast. This presentation will focus on the skill of the EFI at longer ranges beyond day 7. The area under the Relative Operating Characteristic curve (ROCA) has been used operationally as a skill measure. Usually the number of EFI values that fall into the extreme categories (closer to both ends of the EFI interval) diminishes with longer lead times, chiefly due to an increase in the forecast uncertainty. The distribution of the EFI values versus lead time will be presented to help assess the relative predictability of extreme weather events at longer lead times. Recently some tests of the EFI/SOT in the extended-range forecasts up to week 5 have been performed. Results from these will be shown in terms of statistical skill scores such as ROCA, and together with this some cases of extreme weather will be shown to shed light on the EFI performance. The key question we will try to answer in this presentation is about the time horizon at which the ensemble forecast currently exhibits genuine skill in predicting extreme weather. Consideration will also be given to how any such skill levels depend on the weather parameter in question.