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Predicting high impact weather events beyond the medium range

Wednesday, 4 September 2019 16:00 (50 minutes)

In line with its long-term strategy, ECMWF has recently developed new diagnostics designed to support the prediction of severe weather in Europe. Predicting severe events presents several challenges. It is difficult to gather a large enough sample to get robust statistics. Each event has its own unique nature. A specific physical process relevant for the development of one cold spell, as for example the stratospheric sudden warming, might not play a relevant role during another cold event. As a consequence, it is difficult to identify weaknesses in the forecasting system that have a significant impact on the predictive skill of all events. We will discuss the key processes for predicting the severe temperatures events at different time scales, with emphasis to those factors relevant at sub-seasonal time scale. We will examine the forecast performance during the most recent severe cold events and heat waves, highlighting the strengths and weaknesses of the current forecasting systems. While at medium range, predictions for severe temperature conditions can be directly based on temperature forecast probabilities, at the extended range, the predictable signal for severe and persistent cold/warm spells is better exploited using large-scale circulation patterns. For example, we will show that reliable extended-range forecasts of flow patterns such as the NAO and blocking are instrumental for early warnings of severe cold events over Europe.

Primary author: FERRANTI, Laura (ECMWF)

Co-authors: MAGNUSSON, Linus (ECMWF);   VITART, frederic (ecmwf)

Presenter: FERRANTI, Laura (ECMWF)

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