An autopsy of seasonal hydro-meteorological forecast performance for flood early warning

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The interplay of hydro-meteorological factors, such as precipitation and soil moisture, and their timing, spatial extent and magnitude, is a key driver of large hydrological extremes. Understanding the relative contribution of these time, space and magnitude patterns in the run-up to a flood event is vital in improving its prediction. To our knowledge, this has been left mostly unexplored on seasonal timescales, and deserves further attention to reach a more complete understanding of flood event generation at longer lead times.

We have developed an 'autopsy' technique to assess the relative contributions of various hydro-meteorological variables (i.e. their time, space and magnitude patterns) to the predictability of extremely high streamflow (as a proxy for floods) on seasonal timescales. Here, we perform this autopsy technique on the EFAS (European Flood Awareness System) seasonal hydro-meteorological forecast, to analyse its performance for flood early warning for the May-June 2013 floods on the Danube River basin.