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Warnings verification at the Meteorological and Hydrological Service of Croatia

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The major role of national meteorological services is providing of severe weather warnings. This is particularly relevant due to the increased frequency of extreme events and high impact weather. At the Meteorological and Hydrological Service of Croatia various warnings products are issued: from the general public, Civil protection service and MeteoAlarm to different specialized products, such as heat spells, cold spells, forest fire warnings, etc. This paper presents warnings systems, their features and some verification results.
Major problems will be discussed: the forecasting systems exhibit strong oversensitivity on the choice of thresholds that results in significant noise, and unusual number of missed events. Furthermore, for extremely hazardous situations where lives can be threatened, there is also a significant psychological pressure on the duty forecaster, that can lead to certain overforecasting.
Warnings verification is a complex field, due to improper, often inconsistent observation-forecasts data sets characterized by small samples, and contaminated with many non-meteorological components. Furthermore, most verification scores use to degenerate for rare (extreme) events. Therefore, one should be very careful to choose apropriate methods and metrics and to interpret results in a just manner. Verification results will be presented in this paper, mostly through the contingency tables and related verification scores. Since previous seasons in Croatia exhibited temperature extremes, the emphasis will be put on heat/cold spell warnings.
All these results give a comprehensive insight to the warning forecasting systems, their properties and give a useful feed-back to the forecasters, but also provide a guidance for the improvement of the forecasts.