



Florence 1966: how far ahead can we predict such extreme events with current, state-of-the-art ensembles?

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During the first days of November 1966 a large scale cyclonic system affected Italy causing damages and casualties including in the historical towns of Venice and Florence, with severe losses for cultural and artistic heritage. At that time no weather alert was issued by the authorities.

In the framework of the project for the 50th anniversary of the event, this extreme case has been revisited using state-of-the-art numerical weather prediction systems. Global ensemble forecasts have been produced using the ensemble system (ENS) of the European Centre for Medium-Range Weather Forecasts (ECMWF). ENS has been upgraded in March 2016, and now includes 51 members, with an 18-km resolution and 91 vertical levels, and is run two-times-a-day globally up to 15 days (at 00 and 12 UTC). The ECMWF-ENS forecasts have been initialized using *ad-hoc* analyses, re-produced for the weeks centered around the November 1966 case. Then, higher-resolution limited area ensemble forecasts have been generated, based on the WRF model, with a convection permitting horizontal resolution and using the ECMWF-ENS global data as initial and boundary conditions.

The aim of the work is twofold: firstly it is investigated if and how a similar event could be predicted in advance by the most updated numerical models; secondly which is, if any, the added value of running a limited area model for very extreme rainfall events, in a context where global models are improving their resolution. Quantitative precipitations amounts predicted by the two ensemble systems are compared with respect to observational data available. Then a few considerations are sketched for what concerns the added value of the recent NWP models in issuing weather alerts both at synoptic scale and at regional scale.