

Reassessing the deadliest storm that struck Portugal; 25 November 1967

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Abstract

The storm that struck the Lisbon region between the 25 and 26 November 1967 was the deadliest natural hazard since the 1755 Lisbon earthquake. The sudden floods that occurred during the night between the 25 and early morning of 26 November took everybody by surprise as most of the victims were at home sleeping and didn't notice the accumulation of water in small river streams. The main cause for these catastrophic floods is related to the large amount of precipitation registered during a few hours on the night of 25 November. The official number of dead people was 495, but at that time the regular newspapers were strictly controlled by the government and the catastrophe numbers could have been kept lower for political reasons. Nevertheless, to the best of our knowledge this extreme meteorological episode was never studied in detail.

The storm was identified using the cyclone detecting and tracking algorithm developed to the Euro-Atlantic region by Trigo (2006). This methodology was applied to Z1000 dataset from the ERA-40 reanalyses at the 1.125° horizontal resolution to assess the track characteristics, as well as the cyclogenesis, deepening rate and cyclolysis. ERA-40 reanalyses data were also used to compute a 6-hourly sequence of weather fields, namely precipitation rate, mean sea level pressure, CAPE, wind speed and wind divergence at 250 and 850 hPa geopotential height levels, air temperature at 850 hPa and geopotential height at 500 hPa, wind speed barbs and specific moisture content. This analysis provided an in-depth characterization of the synoptic conditions promoting the outcome of the event, mainly explained by the intense subtropical storm that passed over the area. Finally using a high-resolution (10km) dynamical downscaling approach based on the MM5 model, we have evaluated some of the phenomena gone at a more local scale in order to evaluate the sequence and the severity of the events at a much finer detail.

Trigo I.F. (2006) Climatology and interannual variability of storm-tracks in the Euro-Atlantic sector: a comparison between ERA-40 and NCEP/NCAR reanalyses, *Clim. Dyn.*, DOI 10.1007/s00382-005-0065-9