EMS Annual Meeting Abstracts
Vol. 14, EMS2017-210, 2017
© Author(s) 2017. CC Attribution 3.0 License.

Thunderstorm24: A publicly available website, focused on convection and lightning nowcasting and forecasting over Europe, based on the WRF numerical prediction model and NWC SAF products

Athanassios Karagiannidis, Konstantinos Lagouvardos, Vassiliki Kotroni, and Theodore Giannaros

National Observatory of Athens, Institute for Environmental Research and Sustainable Development, Athens, Greece (thankar@live.com)

Thunderstorm24 (http://thunderstorm24.com/) is an initiative of the Institute for Environmental Research and Sustainable Development of National Observatory of Athens (IERSD-NOA), Greece. It offers info and news along with nowcasts and forecasts of convection and lightning over the European continent.
The NWC SAF v2016 software is used to produce a series of near-real time estimations of convection related parameters for the following 15 minutes. NWC SAF is driven by the Weather Research and Forecasting (WRF) model, version 3.6.1. NOA operates NWC SAF in 15 minute cycles and produces a series of parameters in the native Meteosat grid. Important convection-related fields like “Cloud Top Height”, “Convection Rainfall Rate”, and “Precipitation Probability” are then visualized using the NCAR Command Language (NCL) version 6.2.1. The nowcasting information is complemented with real time observations of lightning discharges of the ZEUS VLF lightning detection network. The ZEUS network comprises of 6 long range sensors across Europe and 1 in Alexandria, Egypt, and is operated by the National Observatory of Athens since 2005.
Forecasts of convection-related parameters like, “Lightning Intensity”, “Total Precipitation”, “Convective Precipitation”, “CAPE”, “Wind Shear” and “Relative Helicity” are produced by the WRF model. Numerical forecasts are computed on one modeling domain, encompassing Central-South Europe, with a horizontal grid resolution equal to 24 km. In the vertical dimension, 28 unevenly spaced full sigma levels are specified, with the model top set to 100 hPa. For the initialization of the model, the 00:00 UTC Global Forecast System (GFS) data, provided by the National Centre for Environmental Predictions (NCEP), were used. Operational, daily forecasts extend to 84 h, allowing for a 12 h model spin-up. Out of the remaining 72 h of forecast data, the first 48 h are employed as input data for SAF NWC in GRIB-2 format after appropriate post-processing.
The combination of the available information enables the user to have a clear picture of the real time situation over Europe regarding convection and lightning, while it can also be used to analyse the evolution of convective systems and the related lightning activity. Finally, forecasters can refer to the relative products to form an accurate and on-time estimation of convection-related phenomena.
The website is complemented with a Facebook page (@Thunderstorm24) where news, images and related videos are uploaded. A twitter account (@thunder_storm24) is also available serving the purpose of rapid headline news distribution.