Geophysical Research Abstracts
Vol. 17, EGU2015-12542, 2015
EGU General Assembly 2015

Fire danger assessment using ECMWF weather prediction system

Francesca Di Giuseppe, Florian Pappemberger, and Fredrik Wetterhall
ECMWF, Reading, (nen@ecmwf.int)

Weather plays a major role in the birth, growth and death of a wildfire wherever there is availability of combustible vegetation and suitable terrain topography. Prolonged dry periods creates favourable conditions for ignitions, wind can then increase the fire spread, while higher relative humidity, and precipitation (rain or snow) may decrease or extinguish it altogether.

The European Forest Fire Information System (EFFIS), started in 2011 under the lead of the European Joint Research Centre (JRC) to monitor and forecast fire danger and fire behaviour in Europe. In 2012 a collaboration with the European Centre for Medium range Weather Forecast (ECMWF) was established to explore the potential of using state of the art weather forecast systems as driving forcing for the calculations of fire risk indices. From this collaboration in 2013 the *EC*-fire system was born. It implements the three most commonly used fire danger rating systems (NFDRS, FWI and MARK-5) and it is both initialised and forced by gridded atmospheric fields provided either by ECMWF re-analysis or ECMWF ensemble prediction systems. For consistency invariant fields (i.e fuel maps, vegetation cover, topogarphy) and real-time weather information are all provided on the same grid. Similarly global climatological vegetation stage conditions for each day of the year are provided by remote satellite observations. These climatological static maps substitute the traditional man judgement in an effort to create an automated procedure that can work in places where local observations are not available.

The system has been in operation for the last year providing an ensemble of daily forecasts for fire indices with lead-times up to 10 days over Europe and Globally. An important part of the system is provided by its (re)-analysis dataset obtained by using the (re)-analysis forcings as drivers to calculate the fire risk indices. This is a crucial part of the whole chain since these fields are used to establish the initial conditions from which the forecast is subsequently run. The reanalysis dataset goes back to year 1980 (the starting year of ERA-Interim integrations) and is updated in quasi real time. In addition of providing the staring point for the operational forecasts it is a very useful dataset for the scope of calibration and verification of the system. Assuming reanalysis fields are good proxies for observations then, by comparison with fire events which really occurred, this dataset can be used to assess the potential predictability of fire risk indices.

In this work we will introduce the EC-fire system. Then the reanalysis dataset will be used to identify regions of high fire risk predictability and where the system might be in need of further refinement.