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EDUCATIONAL SOFTWARE FOR FIRE WEATHER INDEX

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Keywords: Fire, FWI, Training tools

Target groups

- **Educational stakeholders**
- **Professional organisations and federations**
- **Policy makers**

Relevance to the case-study requirements

Mediterranean Europe, and Greece in particular, are regions vulnerable to increased fire risk due to changing climatic conditions. The analysis of fire risk for regions where forest fires represent a major hazard can provide wildfire stakeholders with a better understanding of what they need from climate services. To demonstrate the potential value of the climate services to a broad audience (i.e. Short-term fire planning, long-term fire policy making and educational stakeholders), informative training tools are required.

The approach

In order to assess fire risk the Canadian Fire Weather Index (FWI) is used. FWI is a meteorologically based index used worldwide to estimate fire danger in a generalized fuel type. The FWI System provides numerical ratings of relative fire potential based solely on weather observations. The meteorological inputs to the FWI System are daily noon values of temperature, air relative humidity, 10m wind speed and precipitation during the previous 24 hours and are described in detail in van Wagner (1987).

As the stakeholders are not quite familiar with the FWI index and in order to make our products more approachable to a wider audience, we deemed it necessary to develop an educational tool for the FWI index. In this context, we have developed two interactive software tools.

The first application tool calculates and plots families of curves of FWI as a function of the meteorological parameters used for its calculation, using a range of theoretical values. The user has the capability to perform a sensitivity analysis of the FWI to the meteorological values used for its calculation thus gaining a theoretical background of the index. This tool is provided as a free software tool to interested users.

The second application tool allows the user to create their own FWI time series using real observational or model data. Users can also manually adjust the meteorological parameters over a range of values, giving the opportunity to study the behaviour of the fire index under different climatic conditions. This tool is also provided as a free software tool to interested users.

References:
van Wagner, C. E., 1987. Development and structure of a Canadian forest fire weather index system, Forestry Tech. Rep. 35, Canadian Forestry Service, Ottawa.

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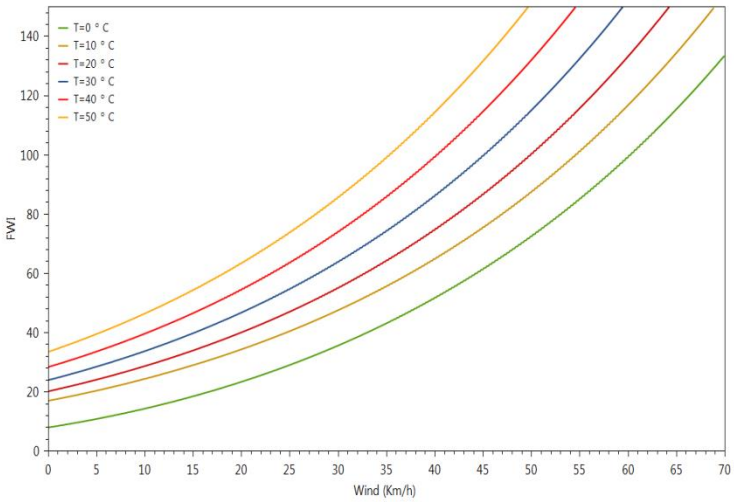
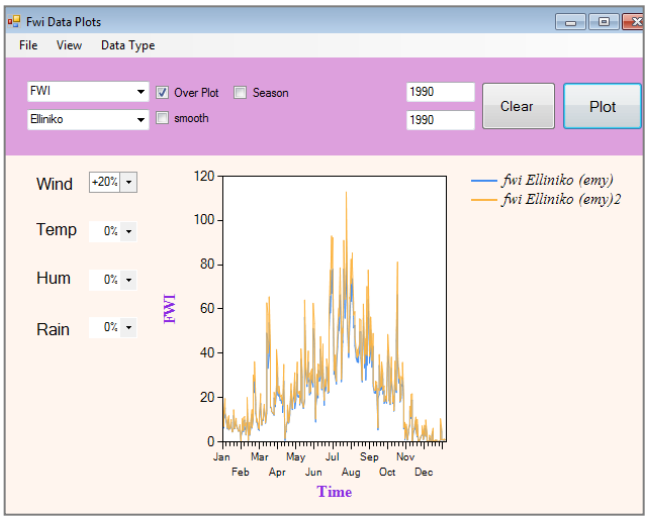
The product

The first application tool calculates theoretical values of the FWI index and plots them accordingly. The user can change one or two meteorological parameters at a time quickly affecting the plot of the index, thus receiving a first understanding on the physics behind the calculation of the FWI.

The user can choose to calculate and plot FWI values versus temperature, wind or relative humidity and has the opportunity to export the images and the data used for their production. The plot to the right shows the variation of FWI with wind over a range of temperature values.





The second application tool runs on real data. The user can now create and interpret their own FWI time series.

The choices of data include either data from the National Meteorological Service of Greece or data from a regional climate model such as RACMO2-KNMI or even the user's own data.

The user can focus on the fire weather index or on each one of its components and display them on graphs for the location of interest. The graph inset can display the time evolution of an index component for a certain period of time (data series available for 1960-2000), as well as its daily means on an annual or seasonal basis.

Once the desired plot is generated, the user can change the four meteorological parameters affecting FWI and overplot the new FWI values, thus receiving a second insight into the physical inner workings of the index.

Making the product usable

We anticipate that these interactive applications will be a useful tool in the hands of policy makers and local Government Officials who wish to gain training on the behaviour of fire risk indices and to calculate fire risk for their region of interest using their own meteorological data. To encourage users to provide their own data, a simple manual of instructions regarding the second application is planned. Furthermore, since the user can currently only focus on a selected number of locations with available meteorological measurements, we plan to expand the present database using gridded observational data together with regional climate model output, thus providing a broad selection of locations for the potential user covering the entire Greek and/or Mediterranean domain upon request.

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Further information: www.noa.gr