Image adapted from FEB

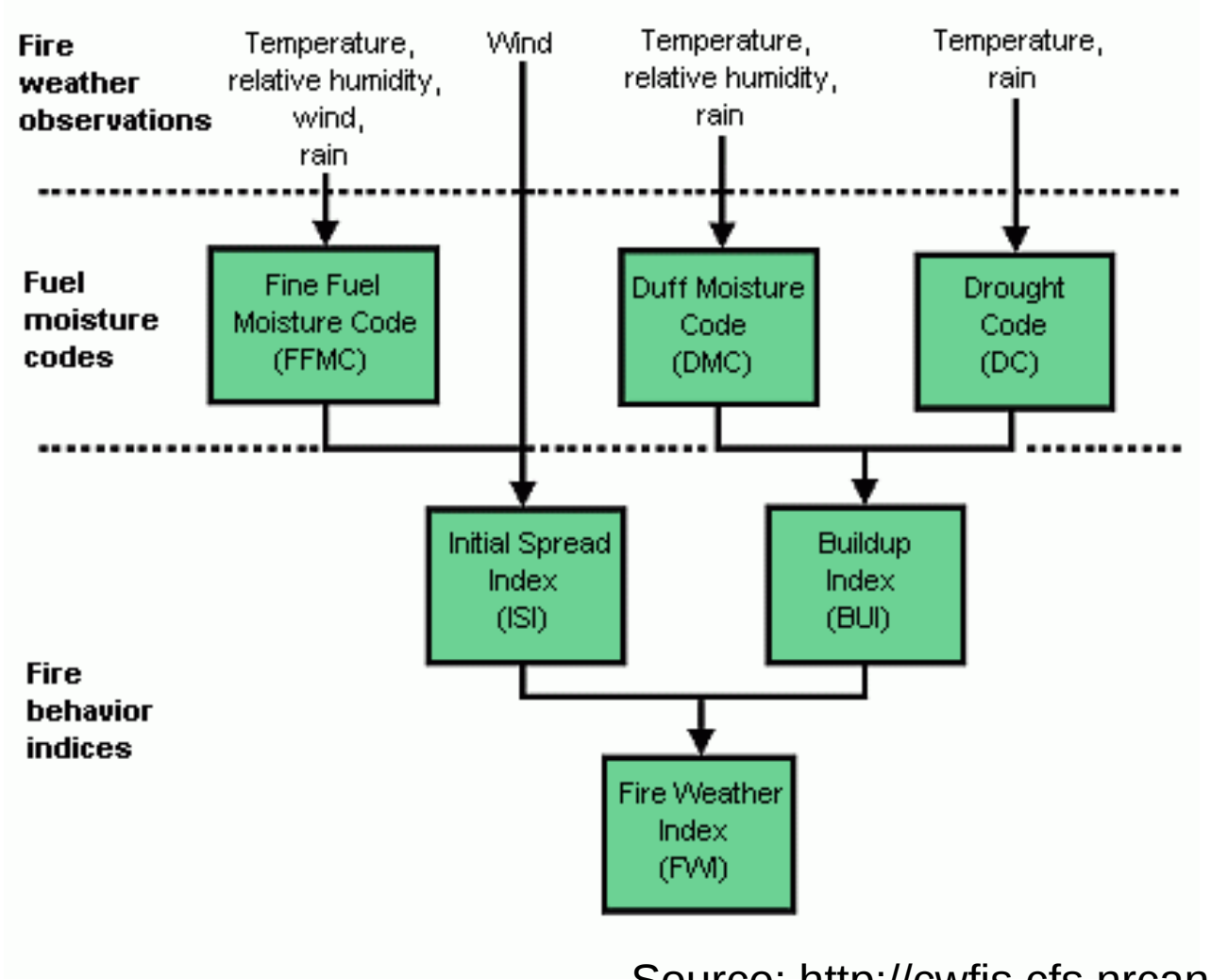
Forecasting hourly Fire Weather Index: an application to Portugal

Miguel M. Pinto, Carlos C. DaCamara,
Isabel F. Trigo, Ricardo M. Trigo

INSTITUTO DOM LUIZ

Ciências ULisboa

The Canadian Wildfire Information System



Source: http://cwfis.cfs.nrcan.gc.ca

Why do we need a hourly based FWI?

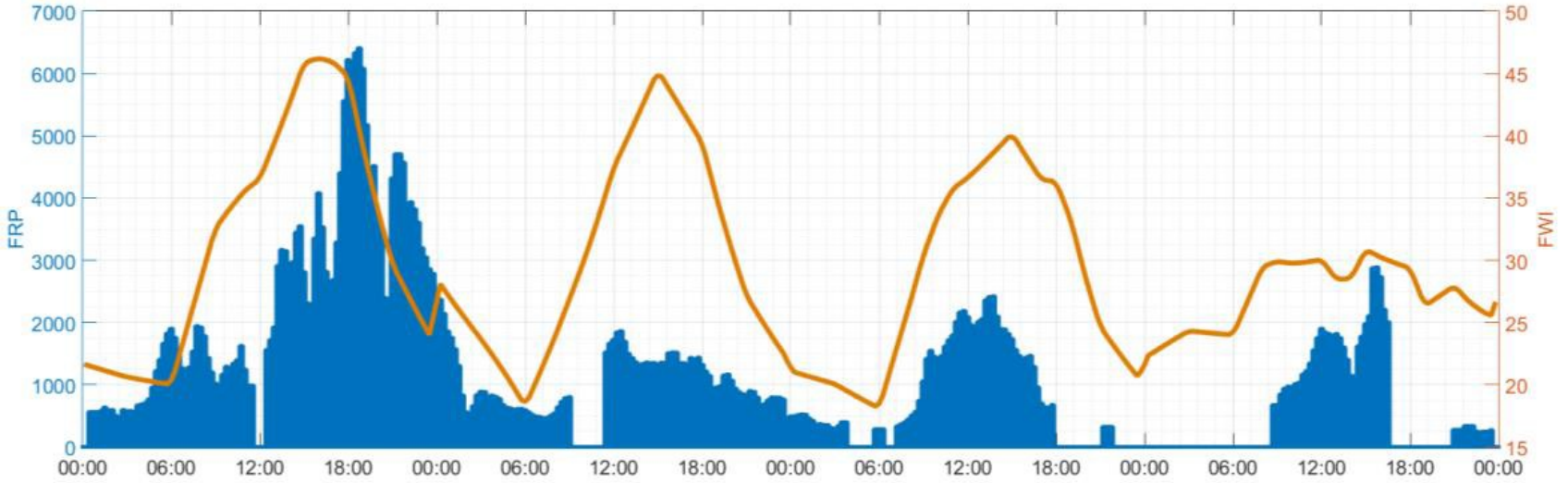
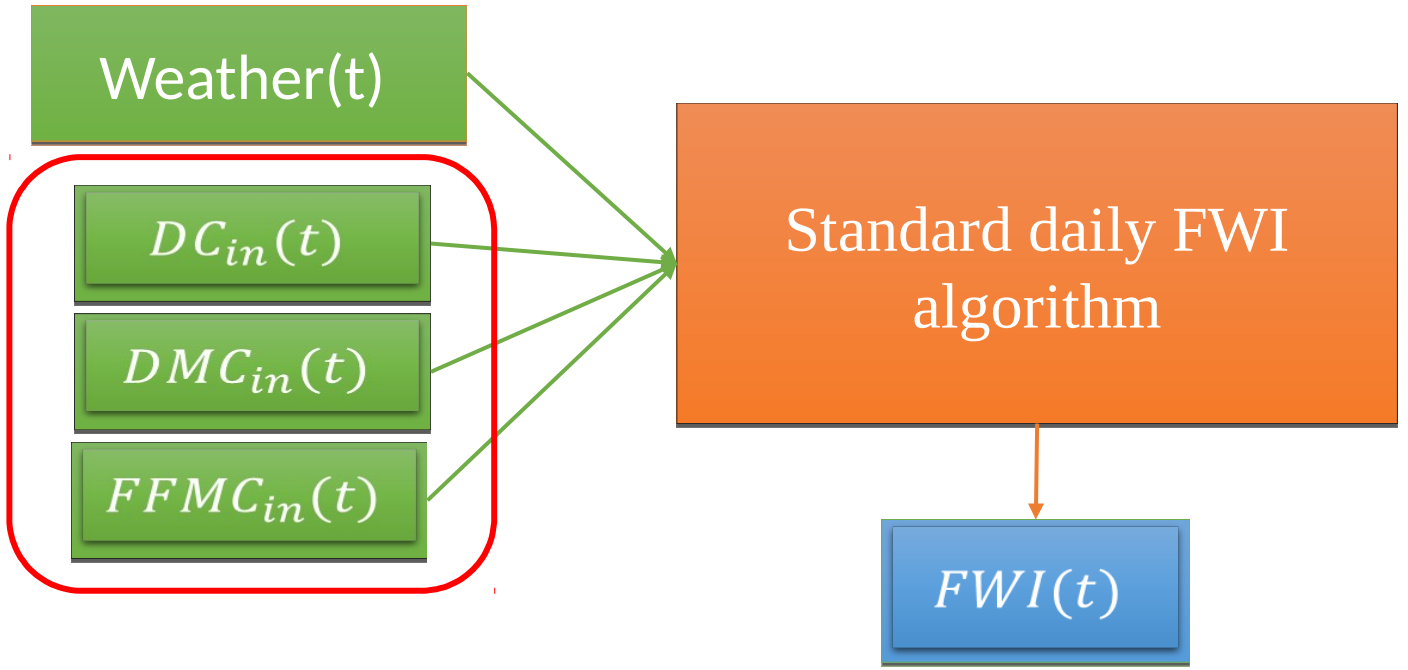


Fig. 1. FRP and FWI for a fire in Cabreiras (Viana do Castelo, Portugal) between 8 and 11 August, 2016.

How is it defined?



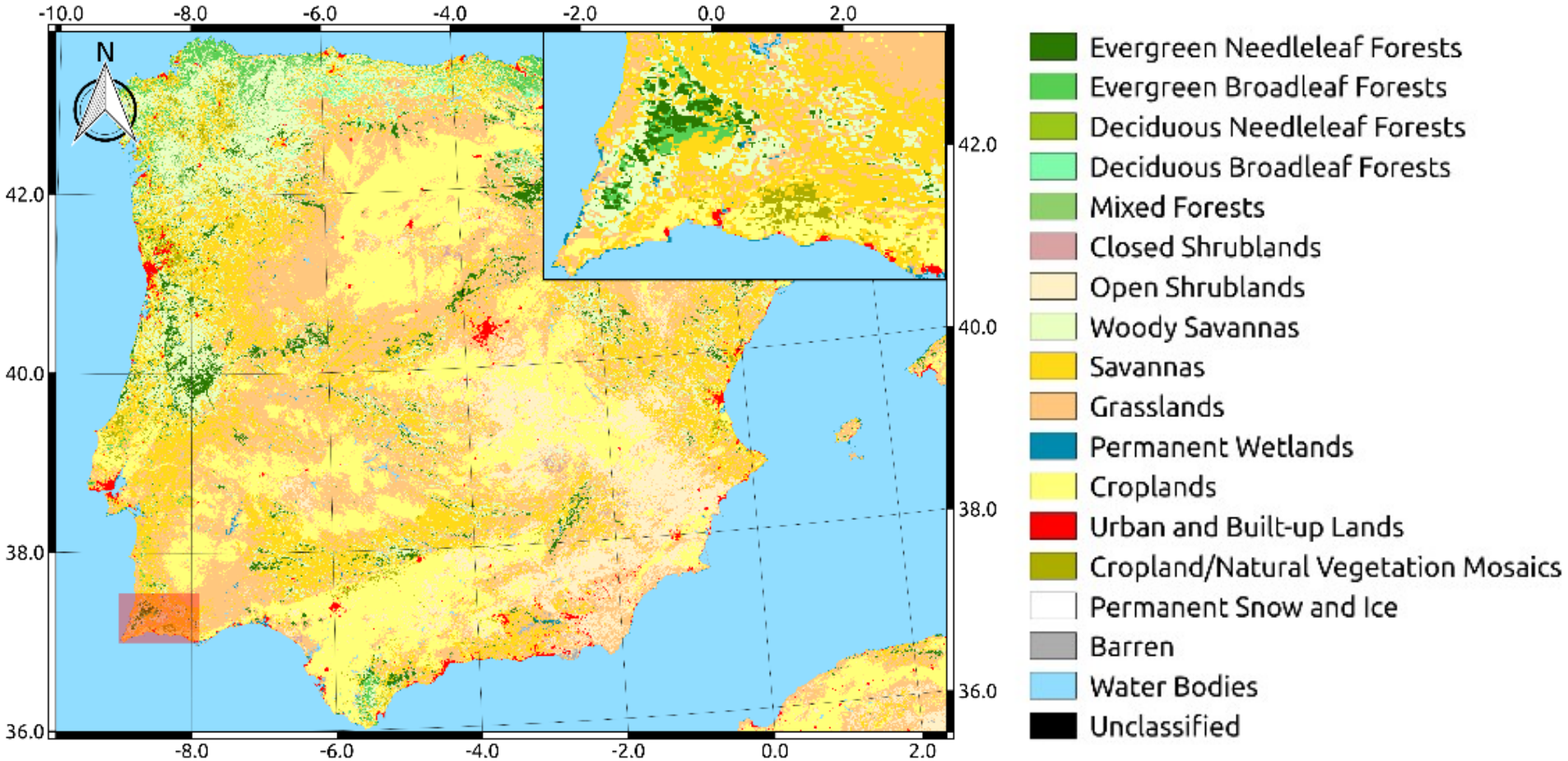
$$DC_{in} = F \times DC_0 + (1 - F) \times DC_1^*$$

- DC_0 - most recent 12h UTC DC value.
- $DC_{1^{st}}$ - 2nd most recent 12h UTC DC value.

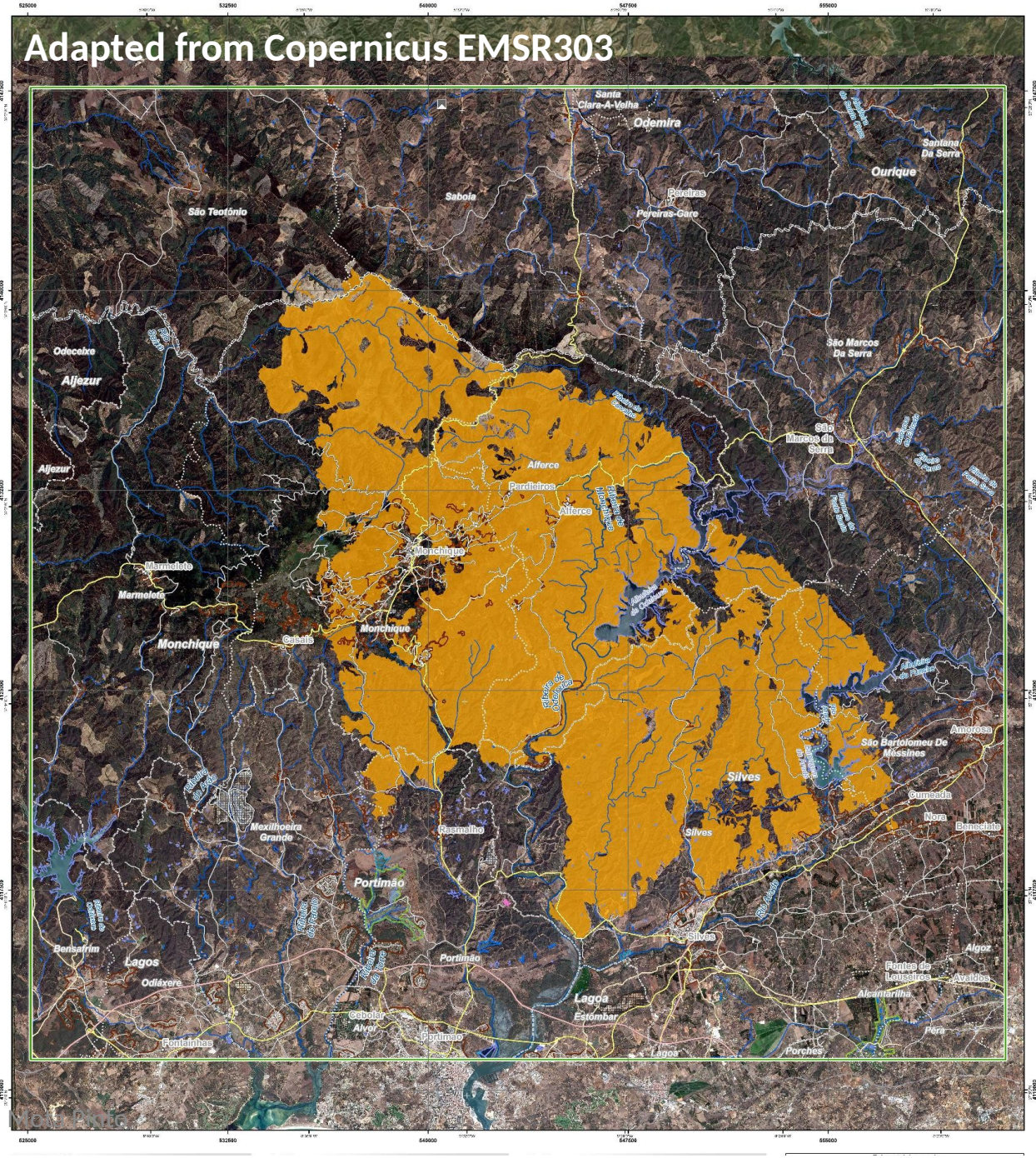
*identical for DMC_{in} and $FFMC_{in}$

$$F(t) = \begin{cases} \dfrac{t - 12}{24}, t > 12 \\ \dfrac{t + 12}{24}, t \leq 12 \end{cases} \qquad t \in [0,24)$$

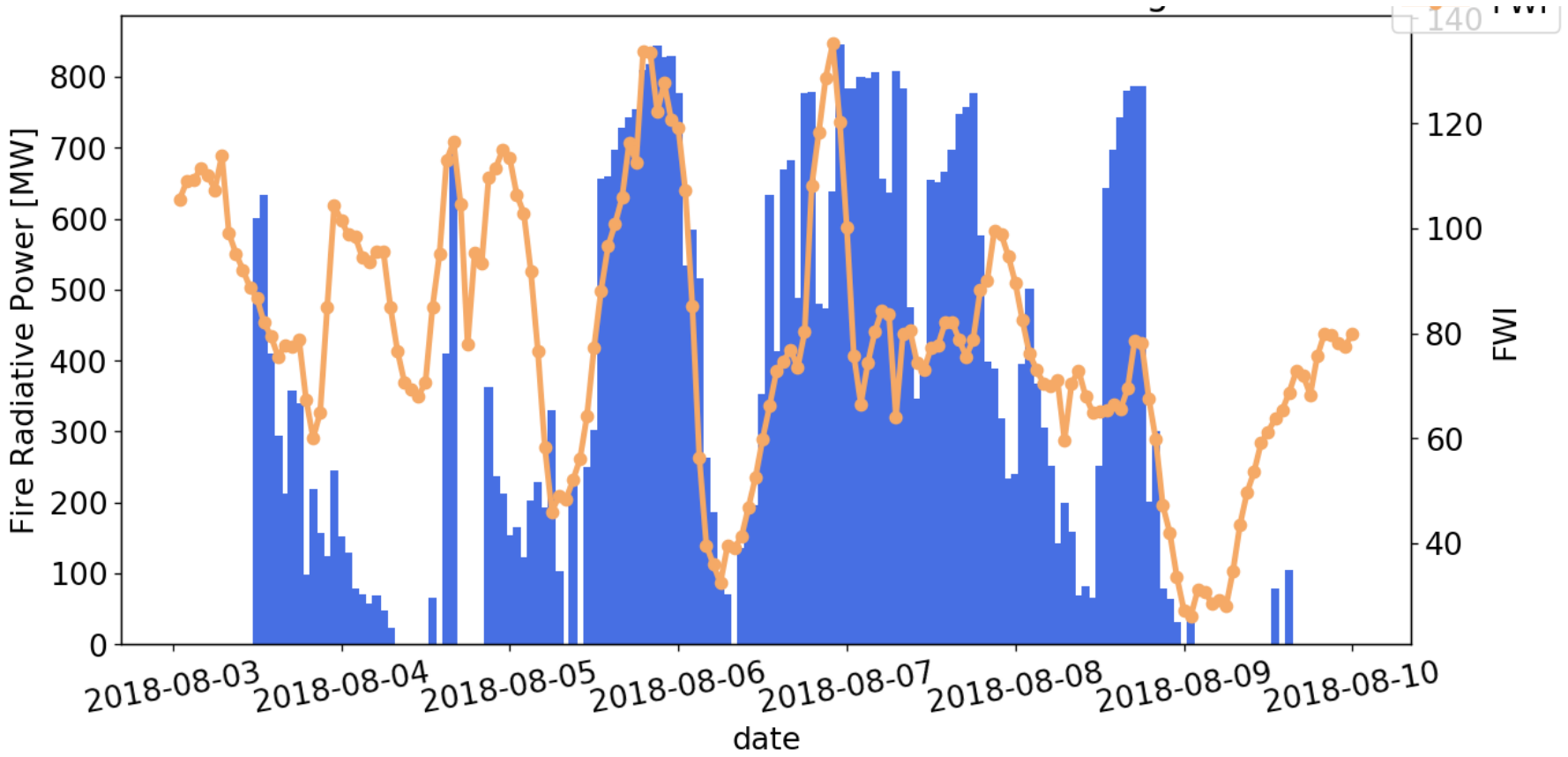
Monchique 2018 fire



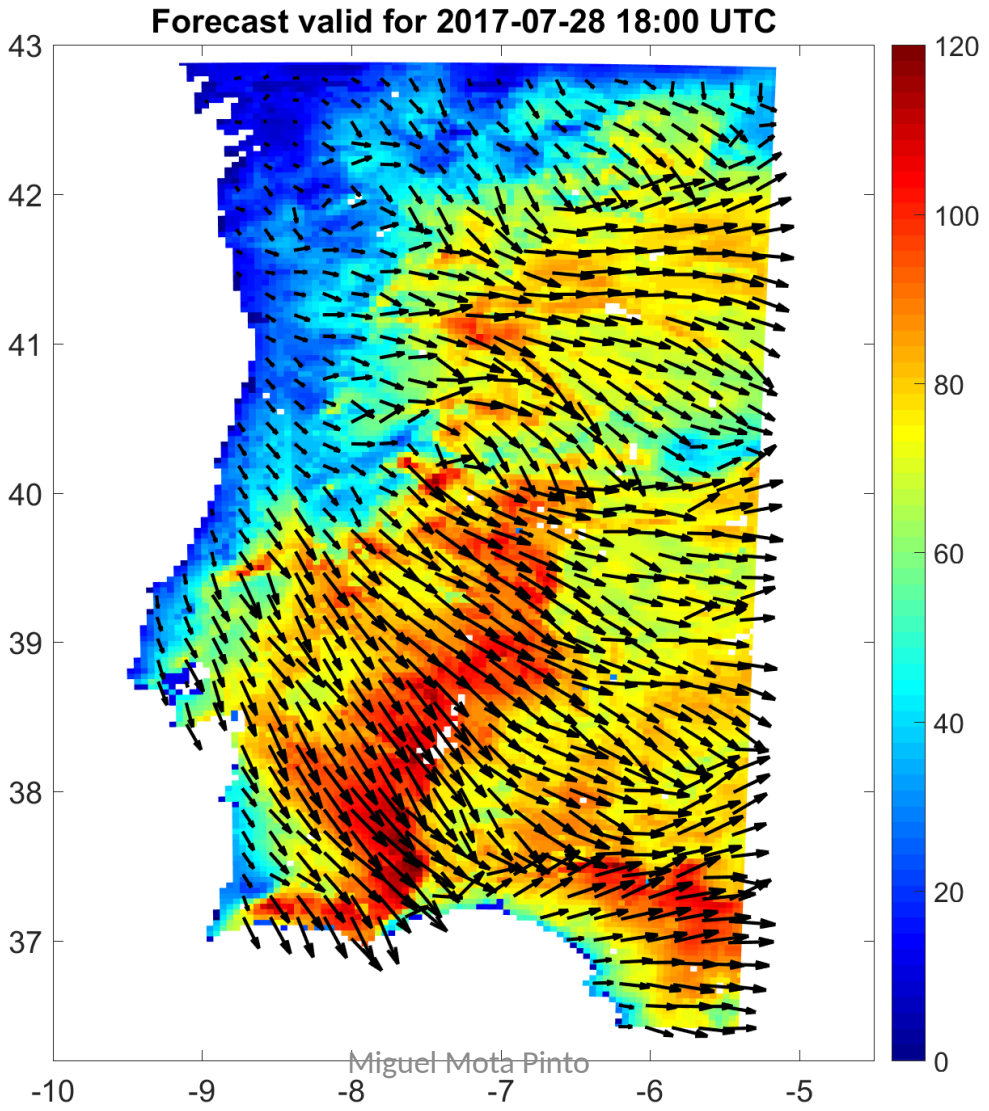
Monchique 2018 fire



Monchique 2018 fire



FWI vector field



Conclusions

- We have proposed a methodology to extend the FWI to sub-daily time-scale which can depict well the sub-daily variablity of fire-prone weather conditions.
- Case studies show that Fire Radiative Power correlates well with hourly FWI and the definition of FWI as vector field with the direction of the wind can be an added value.

Image adapted from FEB