SpitFire

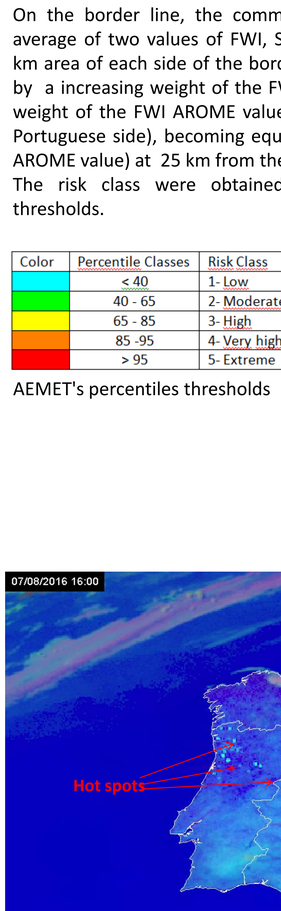
The SpitFire project is cofinanced by European Commission from the contract ECHO/SUB/2014/693768

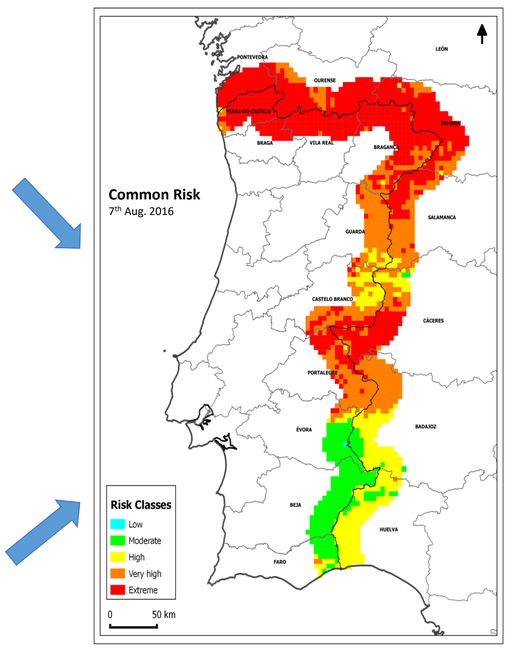
Common Weather Fire Risk Index

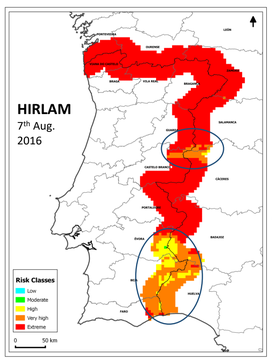
Development of a methodology to obtain a common weather fire risk index to the border area.
Statistical analysis, based on the historical forest fires in the area of interest, in order to validate the outputs.

Common Weather Fire Risk

The common weather fire risk index is calculated as a function of the FWI values calculated for each Numerical Weather Prediction model, HIRLAM (SPAIN) and AROME (PORTUGAL).







On the border line, the common weather fire risk index is the average of two values of FWI, Spanish and Portuguese. On the 25 km area of each side of the border, the common FWI value is given by a increasing weight of the FWI HIRLAM value and a descending weight of the FWI AROME value in the Spanish side (inversely in Portuguese side), becoming equal to the FWI HIRLAM value (FWI AROME value) at 25 km from the border.
The risk class were obtained using the AEMET's percentiles thresholds.

Color	Percentile Classes	Risk Class
	< 40	1- Low
	40 - 65	2- Moderate
	65 - 85	3- High
	85 -95	4- Very high
	> 95	5- Extreme

AEMET's percentiles thresholds

Calibration the Fire Risk Index

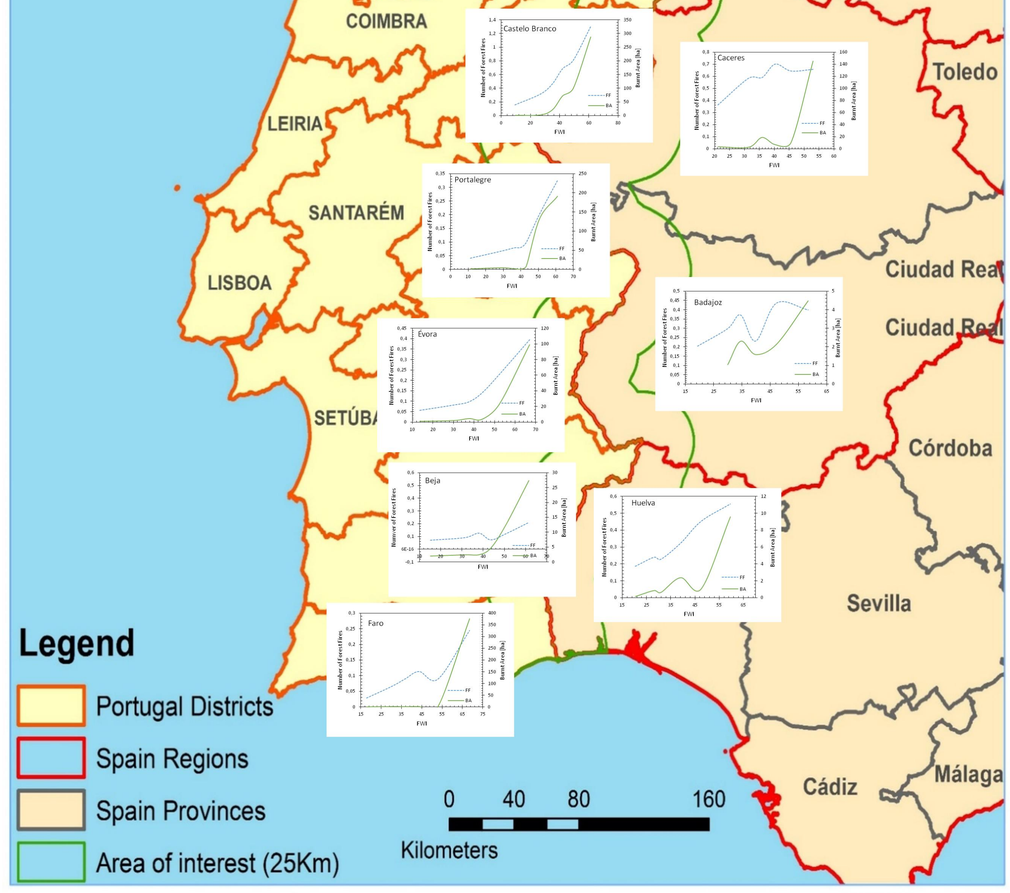
In order to obtain a harmonization of the forest fire risk index in the transboundary area between Portugal-Spain, was made a FWI calibration. This calibration was done for the period between June 1 and September 30 from de year 2006 to 2013.

SET BETWEEN THE LIMITS OF FWI CLASSES

Districts - Provinces	Differences		
	Final		
	-1	0	1
Viana do Castelo - Pontevedra	8	634	4
Viana do Castelo - Ourense	2	861	18
Braga - Ourense	29	853	0
Vila Real - Ourense	15	858	8
Bragança - Zamora	1	590	3
Bragança - Salamanca	1	765	8
Guarda - Salamanca	0	769	5
Castelo Branco - Cáceres	0	793	7
Portalegre - Cáceres	0	793	7
Portalegre - Badajoz	12	668	2
Évora - Badajoz	6	674	2
Beja - Huelva	0	339	0
Faro - Huelva	0	347	0

ADJUSTMENT OF FWI VALUES THAT LIMIT THE FIRE DANGER CLASSES FINAL PROPOSAL

	Fire risk classes – final proposal				
	1	2	3	4	5
Viana do Castelo	<24	36	42	61	>61
Pontevedra	<10	17	22	42	>42
Braga	<21	28	33	47	>47
Ourense	<2	4	6	13	>13
Vila Real	<22	29	34	45	>45
Ourense	<2	4	6	12	>12
Bragança	<32	40	48	56	>56
Zamora	<27	36	46	55	>55
Bragança	<33	39	45	55	>55
Salamanca	<40	48	57	71	>71
Guarda	<18	37	46	57	>57
Salamanca	<30	48	61	74	>74
Castelo Branco	<20	40	48	71	>71
Caceres	<25	37	43	58	>58
Portalegre	<37	43	50	58	>58
Cáceres	<34	38	43	50	>50
Portalegre	<30	43	48	58	>58
Badajoz	<28	38	43	54	>54
Évora	<32	44	50	60	>60
Badajoz	<29	38	44	53	>53
Beja	<23	35	48	59	>59
Huelva	<19	28	43	60	>60
Faro	<33	44	55	69	>69
Huelva	<26	34	45	54	>54

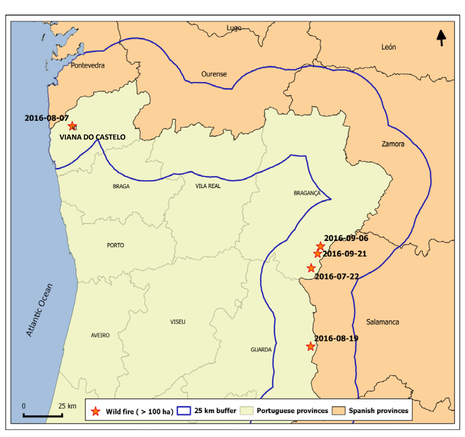


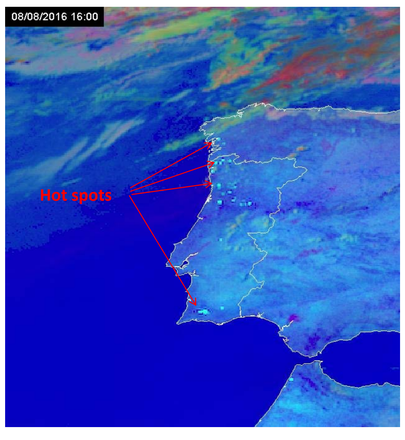
The meteorological parameters necessary for the calibration are: air temperature, relative humidity, wind speed and precipitation. These parameters are recorded in several meteorological stations spread across the two countries, for this study were only used the meteorological stations located at a maximum distance of 35 km on each side of the border, however the area of interest are 25km on each side of the border. In relation to Portugal the calibration was performed at the district level and in Spain ate the province level, that is equivalent to the districts of Portugal.
In the graph displayed on the map above is shown the relation between the average number of forest fires and the burnt area with the values of FWI for each district and province studied.

Wild Fires in Border Area 2016

Spanish airplanes help in fire fighting .
Viana do Castelo (9th Aug. 2016)

Foto: Lusa

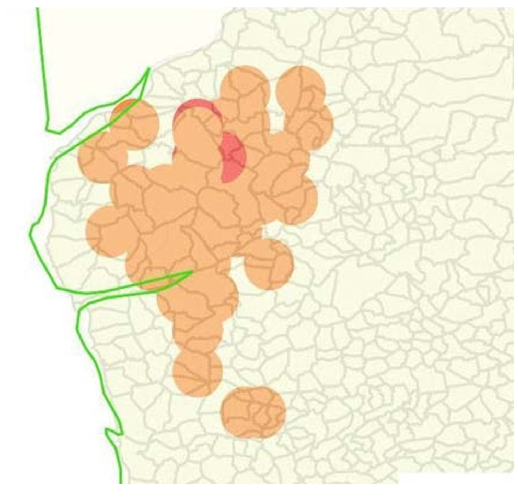




Other Potential Products to be Addressed by SPITFIRE

CO2 Equivalent Released by Fires

Fire Radiation Power, FRP, maps the location of actively burning fires based on proportionality between the rate of thermal radiative burning fires and the rate of biomass consumption and smoke (CO). CO2 equivalent released by fires is 4X Carbon Dioxide.



Fire Radiation Power, FRP. (Viana do Castelo district - Vila Nova de Cerveira wild fire – 7th -10th August 2016)
Land Surface Analysis Satellite Application Facility (LSA SAF)