



A 21st century synoptic climatology of fire-weather conditions in Basque Country.

Santiago Gaztelumendi (1,2), Jose Daniel Gomez de Segura (1), Kepa Otxoa de Alda (1,2), Joseba Egaña (1,2)
(1) Tecnalia R&I, Energy and Environment Division, Meteorology area, Vitoria-Gasteiz, Basque Country, (2) Basque Meteorology Agency (Euskalmet), Vitoria-Gasteiz, Basque Country

Basque Country covers around 723.000 ha of which 53.000 ha correspond to urban and water areas, and 670.000 for agro-forestal use. The wooded forest area reach 55% of the total area of the Autonomous Community: the percentages vary between different historical territories: 46% of Araba, 60% of Bizkaia and 63% of Gipuzkoa.

During this century forest fires burned a mean annual total area of 230 ha (1/3 forestal). The number of fires that occurred in average each year is around 40, for a mean surface per fire of 4.5 ha. The yearly and monthly statistics vary considerably from one year to the next, what could indicate how much the fires characteristics and burn area extensions depends on seasonal meteorological conditions, among other factors.

Despite the fact that among the main causes of forest fires in the Basque Country is the action of humans either through negligence or intentionally, weather conditions are a mayor driver to the behavior and rate of spread of a wildfire. Daily fluctuations in surface relative humidity, wind speeds, and other variables are linked to synoptic-scale circulation patterns. Analyzing the connections between synoptic patterns and surface fire-weather conditions is crucial not only to understand the interactions between wildfire and climate variability but to develop daily fire danger ratings for operational purposes at medium range.

This study uses a synoptic climatological approach, to examine the climatology of fire-weather conditions in Basque Country area during the 21st century. Changes in relative humidity and temperature levels, strength of pressure gradient, and geopotential heights modulate the relationship between the different circulation patterns and the fire-weather condition during a particular day. Examination of daily wildfires incident summaries for major events occurred in Basque Country during this century shows that wildfire activity can be strongly regulated by some critical fire-weather circulation patterns.