

UNIVERSIDAD POLITÉCNICA DE MADRID  
ESCUELA TÉCNICA SUPERIOR DE INGENIEROS DE MONTES



PROYECTO FIN DE CARRERA

ANÁLISIS DE LA ESTACIONALIDAD DE  
INCENDIOS EN LA COMUNIDAD FORAL DE  
NAVARRA MEDIANTE TELEDETECCIÓN

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## ESCUELA TÉCNICA SUPERIOR DE INGENIEROS DE MONTES

**Title:** Analysis of fire seasonality in Navarra through remote sensing.

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### SUMMARY

Navarra is a region with a wide variety of environmental and weather conditions. There are three very well differentiated bioclimatic regions: Mediterranean, Atlantic, and Alpine. The heterogeneity of Navarra allows us to compare several aspects of the three bio-regions; in addition, thanks to the availability of a remote sensing, we have a very versatile and powerful tool for the completion of this type of studies. The objective of this work is the evaluation of the seasonality of fire hazards in the region of Navarra. This seasonality has been defined from fitted functions to time series analysis of the: "Fire Potential Index". For the purposes of this work, the software used was TIMESAT (Eklundh et al., 2010), which was designed to detect phenological parameters from time series generated by remote sensing. In this case, the fire start and length of season have been obtained within a time span of 8 years. A "Fire season" is, in fact, the period when fire hazard is high. This data has been analyzed in order to discover the level of stability of fire seasonality during the years of the study.

As a result, four kinds of fire seasons were identified: each pixel was assigned to a type of fire season. In addition, the occurrence of abnormal patterns during the years was also examined. Summer is the stablest season, associated to the Mediterranean bioregion, and pastures. The so-called "Long season" and the Spring-Summer season have been detected mainly in the Atlantic and Alpine bioregions; they are respectively associated to deciduous and xerofitic forests mainly. These two seasons show average levels of instability. Last, there is Spring season, the most unstable season. In the years in which abnormal patterns have been detected, the length of the fire season tends to increase 1 - 25 days if compared to the duration expected in the course a normal fire season.