Spatio-temporal clustering of wildfires in Portugal

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Several studies have shown that wildfires in Portugal presenthigh temporal as well as high spatial variability (Pereira et al., 2005, 2011). The identification and characterization of spatio-temporal clusters contributes to a comprehensivecharacterization of the fire regime and to improve the efficiency of fire prevention and combat activities. The main goalsin this studyare: (i) to detect the spatio-temporal clusters of burned area; and, (ii) to characterize these clusters along with the role of human and environmental factors. The data were supplied by the National Forest Authority(AFN, 2011) and comprises: (a)the Portuguese Rural Fire Database, PRFD, (Pereira et al., 2011) for the 1980-2007period; and, (b) the national mapping burned areas between 1990 and 2009. In this work, in order to complement the more common cluster analysis algorithms, an alternative approach based onscan statistics and on the permutation modelwas used. This statistical methodallows the detection of local excess events and to test if such an excess can reasonably have occurred by chance.Results obtained for different simulations performed for different spatial and temporal windows are presented, compared and interpreted.The influence of several fire factors such as (climate, vegetation type, etc.) is also assessed.

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