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The role of meteorological and climate anomalies in recent summer time fire events in Portugal

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The last 5 years have been characterized by an extraordinary inter-annual variability of the total Burned Area (BA) with 2003 (450.000 ha) and 2005 (380.000 ha) presenting, by far, the highest values of BA since regular assessments started in 1980. On the contrary, the year of 2007 represents the second lowest value on record (30.000 ha). The years of 2004 and 2006 represent closer to average situations with about 120.000 and 80.000 ha of BA respectively.

In a previous work we have shown that the extent of BA in Portugal (Pereira et al., 2005) is mostly conditioned by two meteorological phenomena: a) the existence of long dry periods with absence of precipitation in late spring and early summer (climate anomaly), and, b) the occurrence of very intense dry spells in days of extreme synoptic situations (weather anomaly). It was also shown that roughly 90% of total BA occurs during summer months (JJAS).

We will show that to a large extent, this large inter-annual variability of BA may be explained by meteorological factors, namely in terms of climate and weather anomalies. For instance, one of the most intense heat events ever recorded in Portugal (and western Europe) took place in the summer of 2003, notability during the first two weeks of August (Trigo et al., 2006), when the most devastating fire events were recorded. Besides, the spatial distribution of burnt areas in 2003 is quite anomalous and in good

agreement with the observed synoptic conditions. Although characterised by relatively high temperatures throughout the summer, the year 2005 was severely affected by one of the most severe drought episodes ever recorded and the climate anomaly had a prominent role in the fire events during summer. On the contrary, the year of 2007 was characterised by a late spring with lower than normal temperatures and by a positive anomaly of monthly precipitation. The recorded climate anomaly associated with mild temperatures in summer together with the occurrence of rainfall events in July and August have contributed to prevent vegetation from heat and water stress, a prime factor that explains the extremely low value of burnt area that was recorded in 2007.

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