Assessment of the potential effects of regional climate change on wildfires

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It has been shown that the extent of burned area in Portugal is controlled by two main atmospheric factors (Pereira et al. 2005): i) a long-term control related to the regime of temperature and precipitation during spring, in the pre-fire season and ii) a short-term control exerted by the occurrence of very intense dry spells in days of extreme synoptic situations during the fire season, in summer. This information has been applied to develop simple multiple linear regression models based on meteorological variables and fire risk indices in the May-August months. For this purpose we use the Portuguese wildfire database which contains detailed information about every fire events occurred in Continental Portugal during the 1980-2000 period and values of the meteorological variables for the same period.

The objective of this work is to assess the potential of regional climate change on wildfires in Portugal, using the aforementioned burnt area models using on meteorological data obtained by the MIROC AOGCM model. We use values of surface air temperature and relative humidity, 10m wind speed and 24 h cumulated precipitation for the 1980-2000 period, from the 20th century model simulations (20c3m), and for the 2051-2100 period from two different scenarios (a1b and b1) SRES Scenarios simulations.

We present and discuss the results obtained for the 20th century simulations (20c3m) and for two different future scenarios (a1b and b1) with the following methodology: i) compute the monthly means /sums of pertinent variables; ii) estimate the monthly burnt area, using the burnt area models; iii) comparison analysis between the statistical distributions of the meteorological variables, meteorological fire indices and monthly burnt areas for the 20th century and future climate scenarios.