



Future burned area projections in Iberia

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The spatial and temporal variability of burned area (BA) in the Iberian Peninsula (IP) was assessed and modeled through the merging of BA records from Portugal and Spain, a new dataset which allowed the construction of projections for future BA in different Iberian sectors. For this purpose, statistical models which reproduce the inter-annual BA variability were calibrated using the 1981-2005 period as a reference and then applied to Regional Climate Models (RCM) outputs for the 21st century.

The relationship between BA and meteorological forcing was assessed using correlation and regression analysis, using the ERA-Interim reanalysis as a benchmark for the reference period. Then a stepwise regression procedure based on the best meteorology-based predictors was applied in order to develop simple BA statistical models for each cluster (models were cross-validated to avoid the danger of over fitting). We concluded that the use of predictors based on both long-term and short-term conditions provide the best results, particularly for western sectors (Pearson correlation coefficients higher than 0.7). We also showed that the daily scale is vital on the short-term, since predictors based on monthly frequencies of extremely hot days (surpassing high percentiles of noon temperature) are the most effective ones.

The reference period bias of four RCM from the ENSEMBLES project was estimated in order to construct future BA scenarios using two different techniques: traditional bias correction and the delta change approach. Multiple scenarios were also developed by using either fixed or moving reference periods, thus highlighting the danger of not considering external variables (e.g. vegetation or land-use changes) when developing such models. Amongst all considered scenarios, our current ensemble projections show the potential for having 2-3 times more BA in the IP by the end of the 21st century.