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Simulating of large scale fire regimes in Euro-Mediterranean region, example of Spain

Sergey Venevsky
Center for Earth System Studies, Tsinghua University, Beijing, China (venevsky@tsinghua.edu.cn)

Process oriented fire model SEVER human dominated Mediterranean is proposed which estimates areas burnt on a macro-scale (10-100 km). It consists of three parts: evaluation of fire danger due to climatic conditions, estimation of the number of fires and the extent of the area burnt. The model operates on daily time step and interacts with SEVER DGVMa Dynamic Global Vegetation Model providing vegetation feedback through available fuel. Fire danger is related to number of dry days and amplitude of daily temperature during these days and calculated using exponential decline in fire probability with soil moisture increase. The number of fires during fire days varies with human population density and as well depends on convective activity in the atmosphere due lightning ignitions. Areas burnt are calculated based on average wind speed, available fuel and fire duration. SEVER FIRE was tested for peninsular Spain. The number of fires and areas burnt were simulated for the period 1974-94 and compared against observations and against an older global fire mode Reg-FIRM where lightning ignitions were absent. The new model produced more realistic results, which are well correlated, both spatially and temporally, with the fire statistics.