



Fire weather risk over Portugal under a changing climate scenario

A. Carvalho (1), M. Flannigan (2), K. Logan (2), A.I. Miranda (1), C. Borrego (1)

(1) Department of Environment and Planning, University of Aveiro, 3810-193 Aveiro, Portugal (avc@ua.pt / Fax: +351 234 370309 / Phone: +351 234370200), (2) Canadian Forest Service, Great Lakes Forestry Centre, Sault Ste Marie, P6A2E5 Ontario, Canada (mflannig@nrcan.gc.ca / Fax: 001 705 5415701 / Phone: 001 705 5415541)

Portugal is one of the European countries most affected by forest fires, mainly during the summer season, which is characterized by a hot and dry weather. In Portugal, weather/climate is the most important natural cause influencing forest fires and climate change may play an important role in this interaction. Then the objective of this study is to address how fire weather severity may change in Portugal by the end of the 21st century under the IPCC SRES A2 scenario. Daily weather data were collected from the regional climate model HIRHAM. The HIRHAM model simulations at 12 km resolution were selected for reference (1961-1990) and future (2071-2100) analysis. The Canadian Fire Weather Index (FWI) System components were computed using daily mean values of temperature, relative humidity and wind and daily total precipitation. Class frequency and percentile estimations of the FWI system components were evaluated for both climates and for each Portuguese district. The obtained cumulative probability functions clearly show the fire weather severity shifts to higher values in a future climate scenario. The results point to an anticipation of the fire season starting and an increase in its length. Spring is the season that will experience the highest increases in terms of FWI reaching more than 150% increase in the districts of Guarda and Coimbra (Centre/North). All the districts indicate at least 100% increase of the FWI in spring except Lisboa, Évora, Setúbal, Beja and Faro (Centre to South). Another important feature is the increase in the 25th percentile values expected with the future climate. This is an important indication on how climate change

may impact not only the maximum values but also a positive shift in the minimum ones. The projected fire weather severity increases in future climate may significantly impact the area burned and number of fire starts in Portugal, with important negative consequences on ecosystems, human health and economy.