Fuel moisture content dynamics under climate change in Spanish forests.

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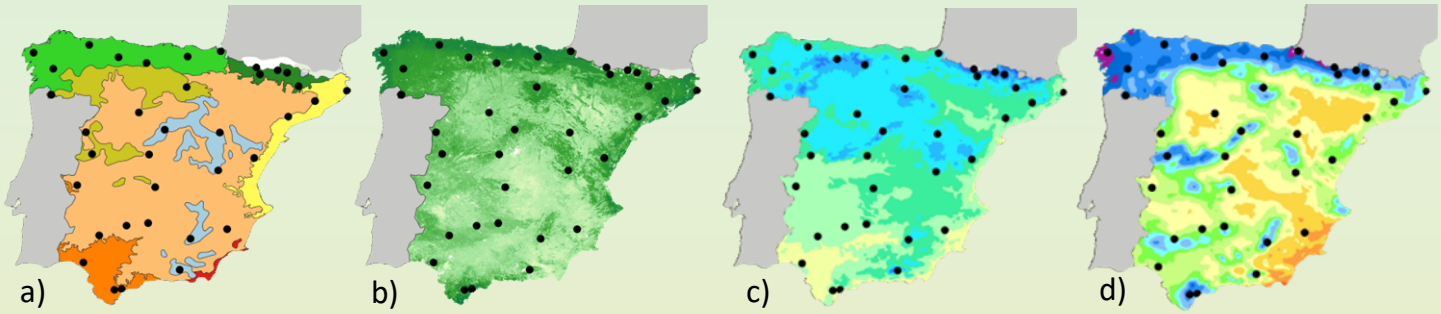
INTRODUCTION

Global warming is expected to increase water scarcity potentially enhancing the days with weather conditions conducive to wildfire spread. In order to asses how fuel moisture (FM) is going to be affected by increasing aridity, we used semi-mechanistic models to forecast changes in live and dead fuel moisture content (LFMC and DFMC) across the 21st century from medium and high greenhouse gas emission scenarios (RCP4.5 and 8.5).

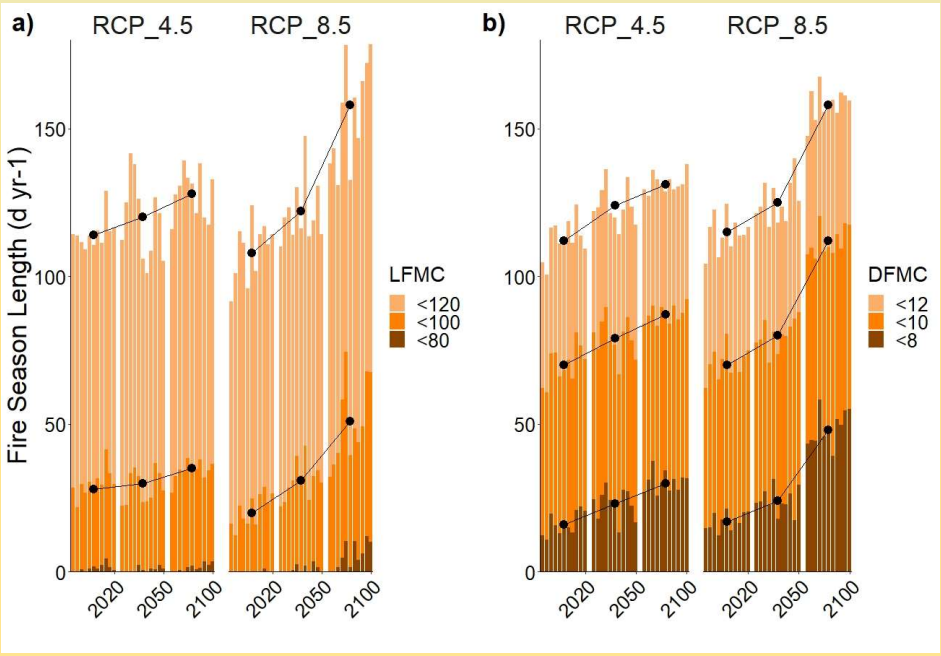


METHODS

We assessed LFMC and DFMC across 36 study sites which corresponds with forest inventory plots, covering ecoregions (a), productivity (b), temperature (c) and precipitation (d) gradients. Future meteorological data was obtained from regional climate models of the Euro-CORDEX adjusted grid. To analyse FM dynamics we assessed changes on the fire season length as the number of days per year (d yr^{-1}) when FM fell below wildfire occurrence thresholds. We established the minimum, critical and extreme threshold values at 120, 100 and 80 % for LFMC and at 12, 10 and 8 % for DFMC.

RESULTS

From 2020 to 2100, under RCP4.5 conditions fire season length increased in 15, 8, 2 d yr^{-1} (a) and in 20, 17, 15 d yr^{-1} (b) regarding minimum, critical and extreme LFMC and DFMC thresholds respectively. Under RCP 8.5 conditions fire season length increased in 50, 30, 5 d yr^{-1} (a) and in 46, 40, 33 d yr^{-1} (b) regarding minimum, critical and extreme LFMC and DFMC thresholds respectively.



CONCLUSION

We recorded generalized fuel moisture declining trends from nowadays to the end of the century that are going to increase the number of days per year with FM values below wildfire occurrence thresholds, lengthening fire seasons.