Forest fires

Forest fires lead to large set of environmental problems (affecting natural ecosystems) as well as economic and social ones. They are a major source of concern in southern European countries. The total burned area in Mediterranean Europe changes significantly from year to year largely because of weather conditions (Camia and Amatulli, 2009), such as strong winds and extremely high temperatures. However, climate change seems to be among the most important drivers of wildfire potential throughout Europe over the longer term.

This assessment has studied how future climate change could affect forest fires in southern Europe. The study has looked into the four JRC PESETA II common climate runs.

Methodology

The first step of methodology is to simulate forest fires through the modelling of fire danger indices as a function of weather conditions. The meteorological fire index used is the Fire Weather Index (FWI) system, of the Canadian Forest Fire Danger Rating System (Van Wagner, 1987), a system used widely all over the world. The FWI system has six components that rate fuel moisture content and potential fire behaviour in a common fuel type (i.e. mature pine stand) and in no-slope conditions. The calculations take into account daily temperature, relative humidity, wind speed and precipitation.

In a second step, the fire danger index is statistically related to the extent of burned areas, based on data for the southern European countries over the 1981-2010 period. Burned area was computed from the European Fire Database of the JRC's European Forest Fire Information System (EFFIS), the main repository of individual wildfire event records in Europe (Camia et al. 2010).

Results are obtained for five southern European countries (Portugal, Spain, Italy, Greece and south of France), where most of the burned area is located (85% of the total burnt area in Europe).

It is important to note that the assessment does not consider adaptation measures or changes in vegetation, ignitions, or other human activity that might affect burned area and thus fire impacts.

Main results and findings

The increase in the annual average FWI can be seen in the Figure below. Compared to the control period, the average burned area is estimated to increase by 100% in the Reference scenario and 46% in the 2°C scenario.
Difference of FWI annual averages between 2071-2100 and 1961-1990 simulations

References


