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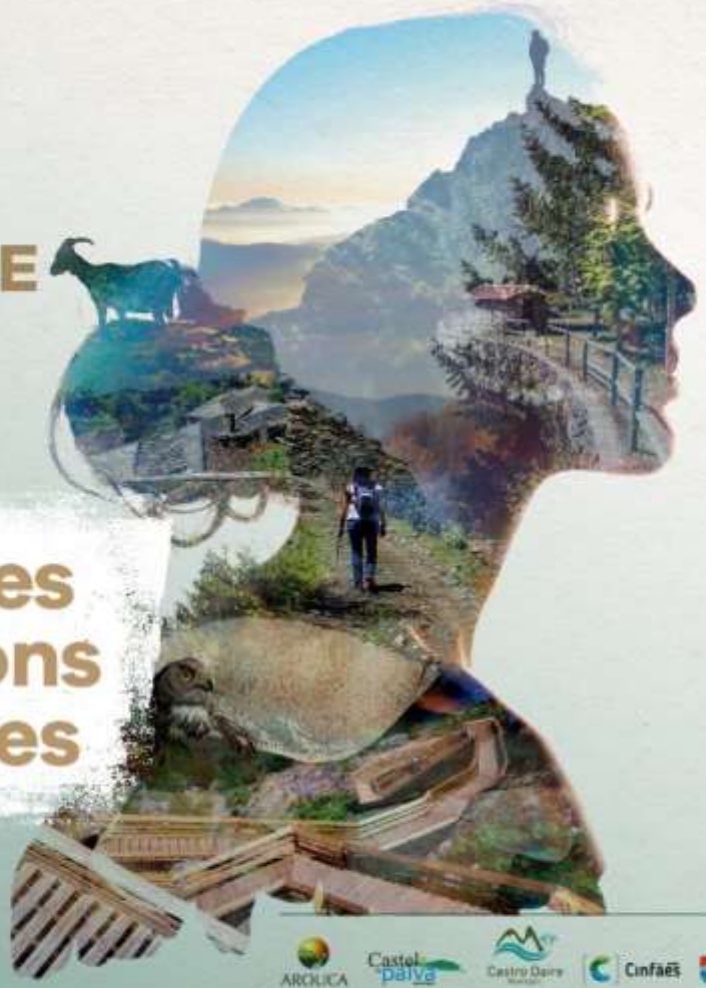

New Voices
New Visions
New Values

for People and Nature in Europe

EUROPARC ADRIMAG MONTANHASMÁGICAS

ARCOLICA Castelo de Paiva Castro Daire Cinfães Vale de Cambra Turismo de Portugal porto norte

COMPETE 2020 PORTUGAL 2020

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Is there a bad/good fire?

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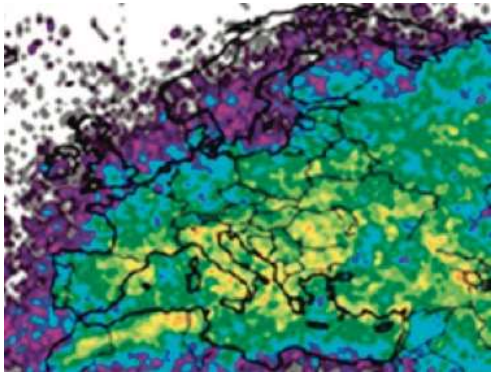
Fire in European ecosystems

Lightning-ignited fires



Human-ignited fires

Temperate Europe

More forest and shrubland, decrease in use and management

Increase in connectivity, decrease in pyrodiversity

More frequent and more severe extreme fire weather events

Fire regime shift: 1960s-1970s

Biomass (fuel) trends

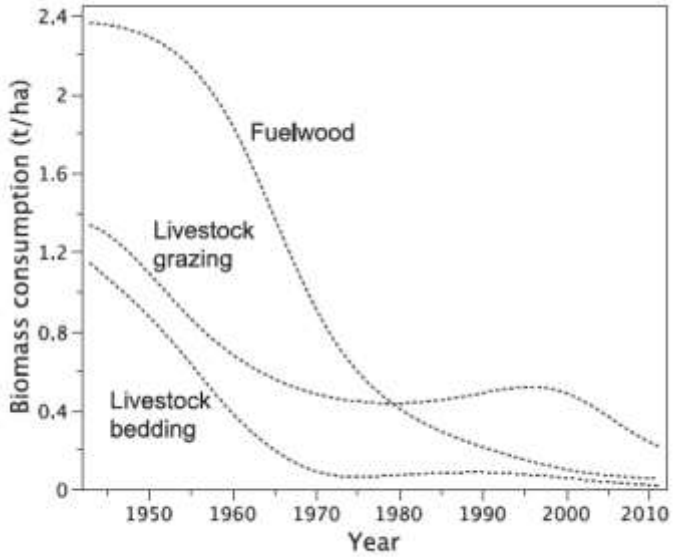
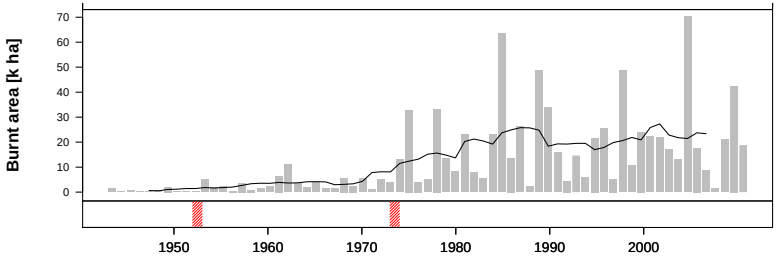


Fig. 2. Time series (1943–2011) of modelled dynamics of biomass consumption in the Portuguese public forest.



Fuel hazard trends

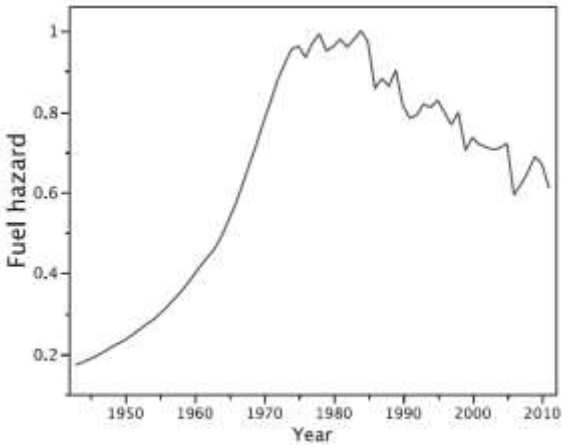
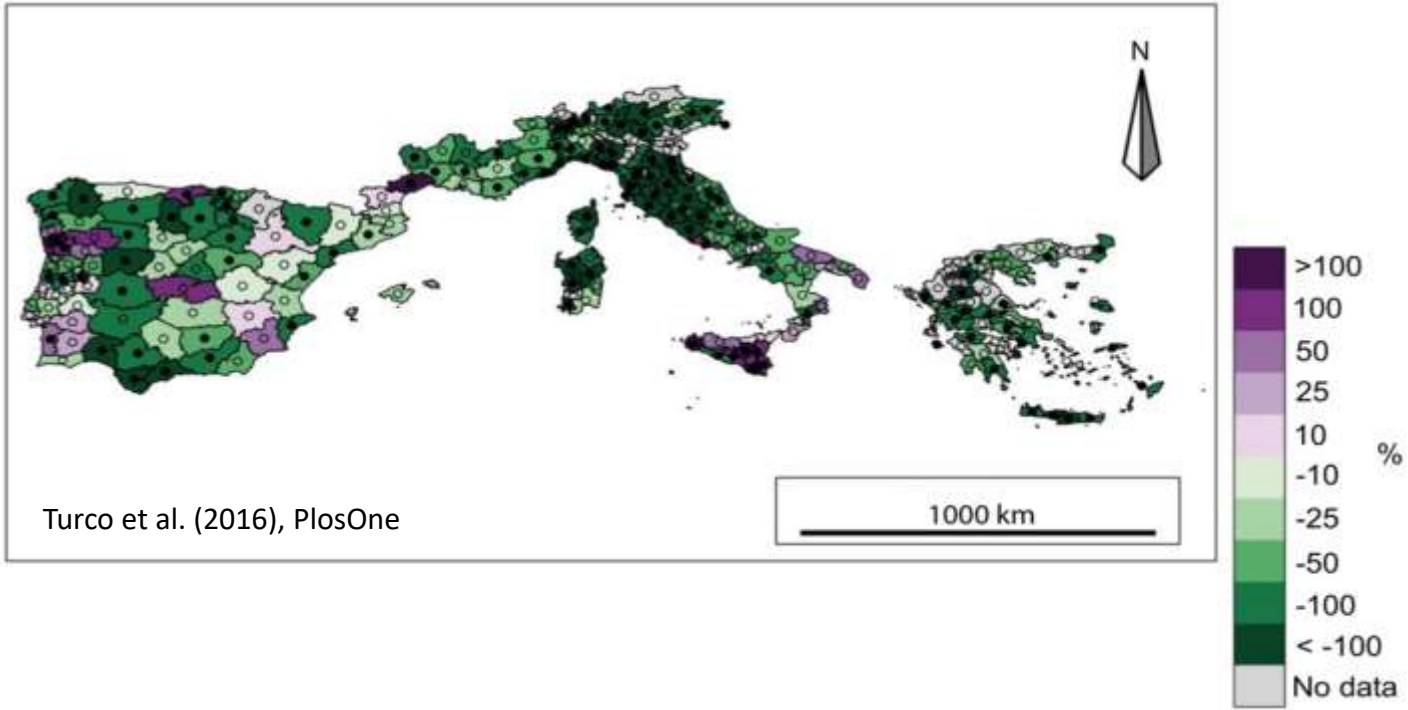


Fig. 3. Time series (1943–2011) of fuel hazard in the Portuguese public forest.

Fire regime shift: 1990s

~66% decrease in burned area **due to fire exclusion policies**



Turco et al. (2016), PlosOne

Fire regime shift: 1990s

Turco et al. (2016), PlosOne

Increased burned area in Autumn to Spring

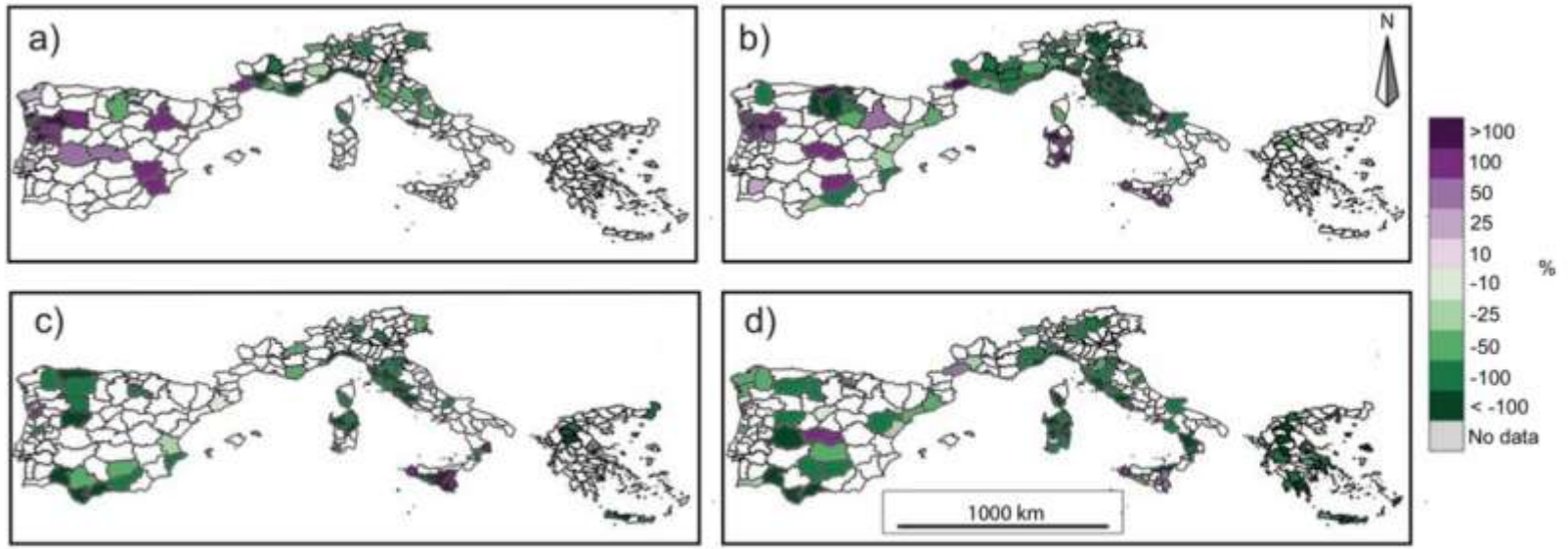


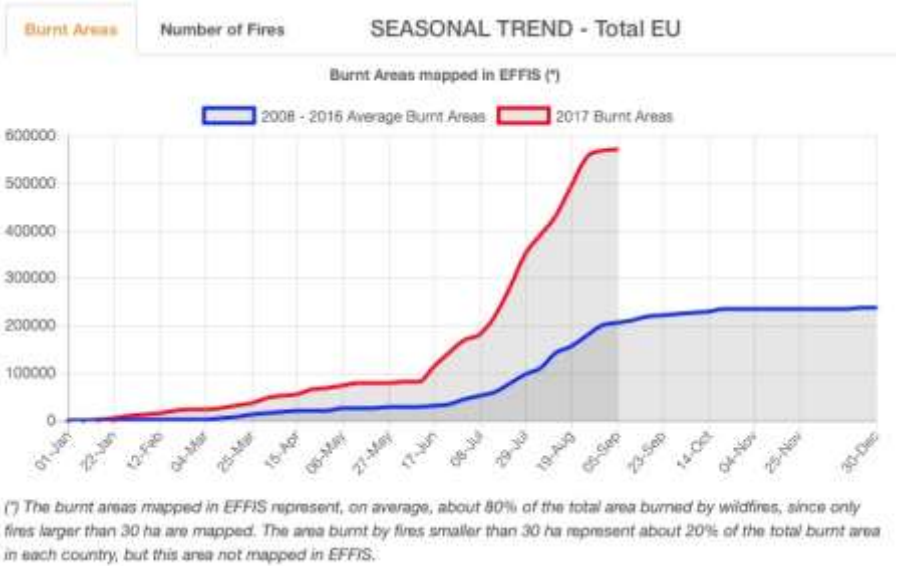
Fig 7. Seasonal trends of the burned area for the period 1985-2011 for (a) December-January-February (DJF), (b) March-April-May (MAM), (c) June-July-August (JJA) and (d) September-October-November (SON). NUTS3 units with more than 5 years of missing data are excluded from the analysis. Only significant trends ($p < 0.05$) are shown. Trends are represented as the percentages of the total trend for the available period (e.g. ha per 27 years) divided by the historical mean calculated over the same period (e.g. 1985-2011).

doi:10.1371/journal.pone.0150663.g007

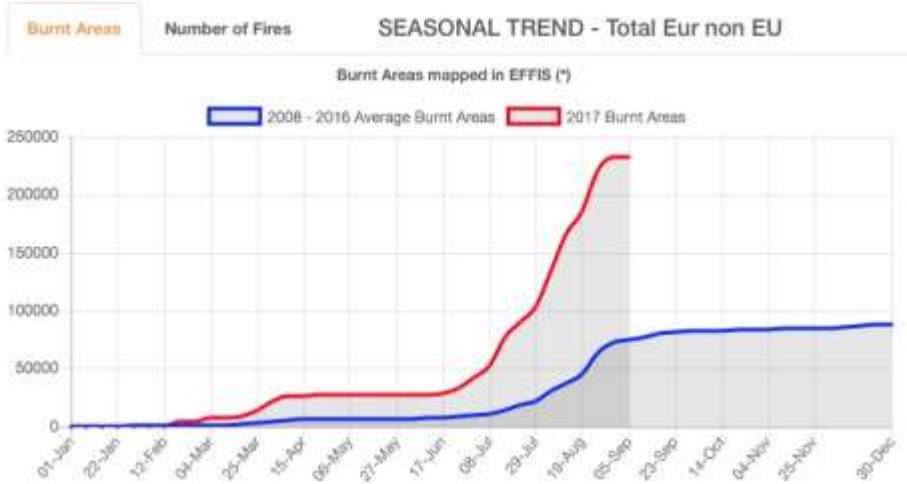
Wildfires in Europe

Mean annual burned area:
324,500 hectares

2017 burned area (so far):
801,700 hectares



(*) The burnt areas mapped in EFFIS represent, on average, about 80% of the total area burned by wildfires, since only fires larger than 30 ha are mapped. The area burnt by fires smaller than 30 ha represent about 20% of the total burnt area in each country, but this area not mapped in EFFIS.

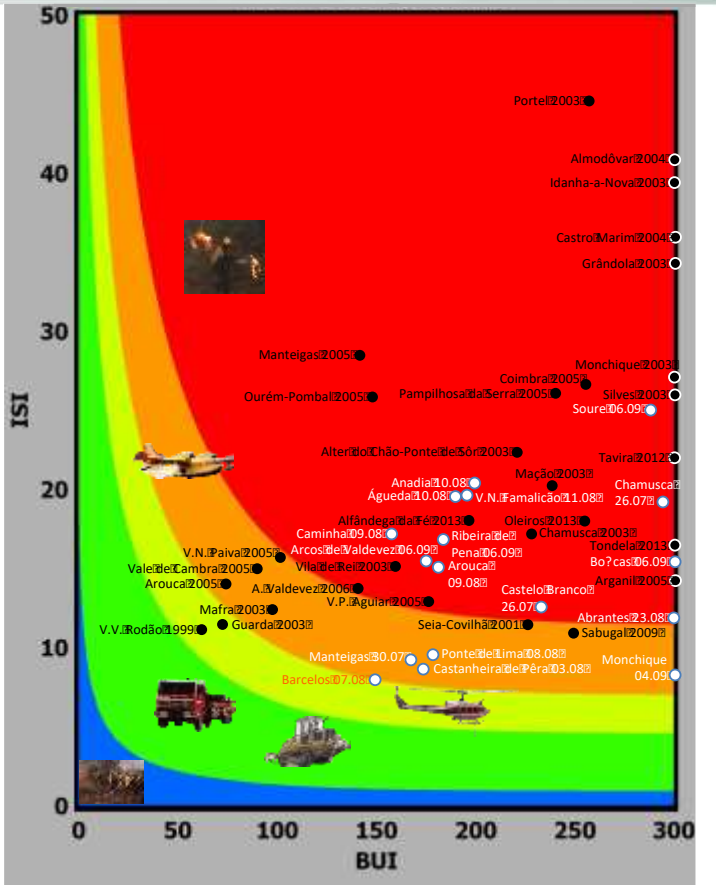


Fire use in a changing landscape, under a changing climate

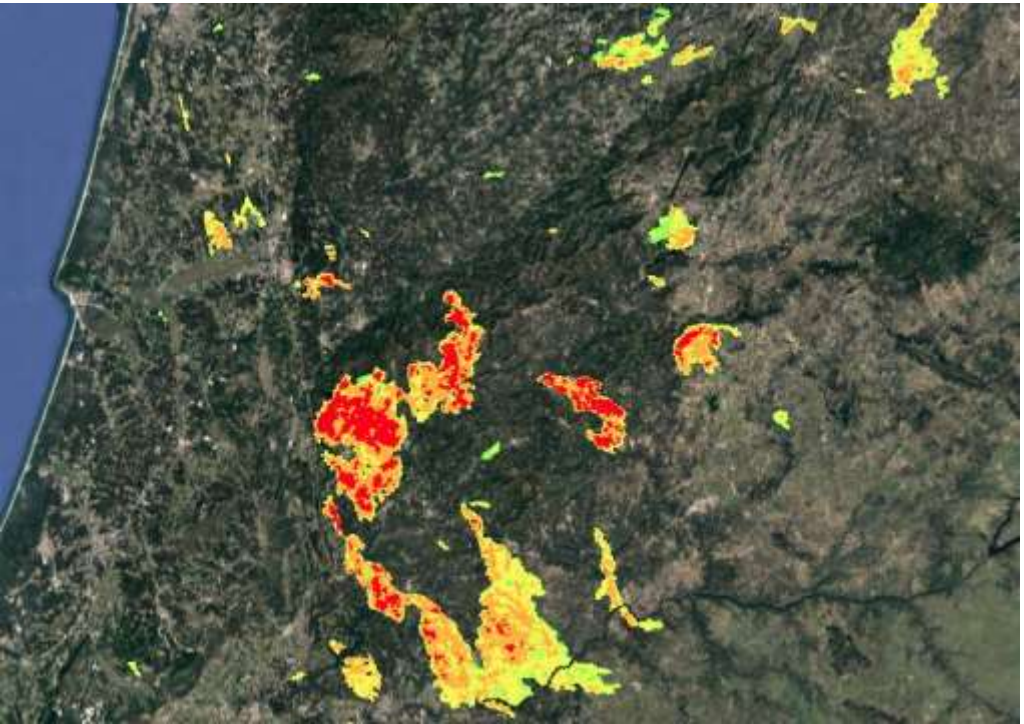
Increasingly larger and severe fires

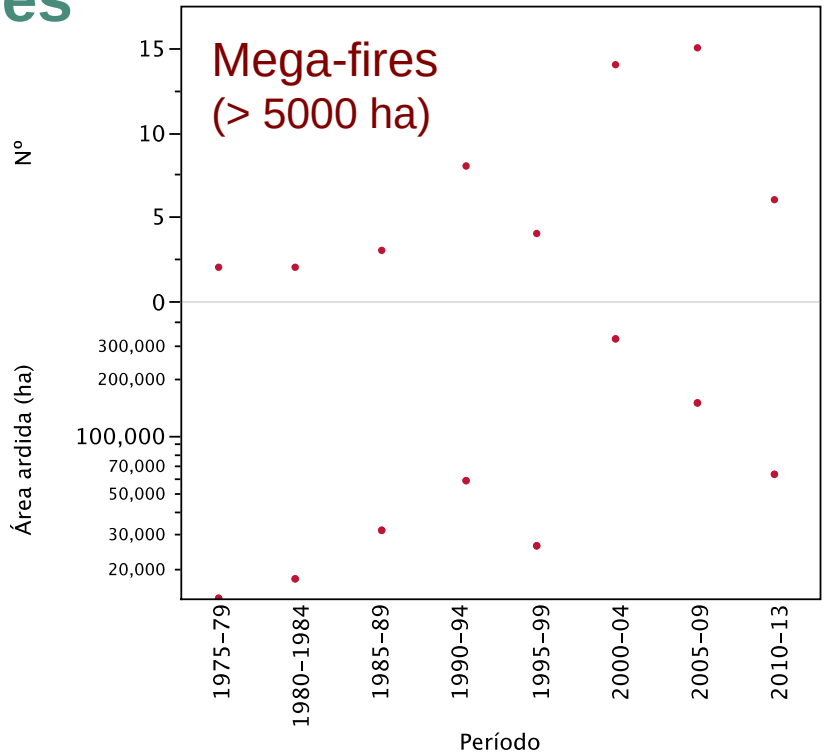
Extreme weather conditions overwhelm fire suppression resources

- ○ 2016 large wildfires
- ● Past wildfires >2500 ha



Increasingly larger and severe fires





Extreme and potentially catastrophic fire behaviour

- Plume-driven fire
- Vorticity
- Profuse spotting
- Fire-induced lightning
- Downburst and very fast rate of spread

2071-2100 fire danger forecasts

Moriondo et al. (2006), Climate Research 31: 85-95

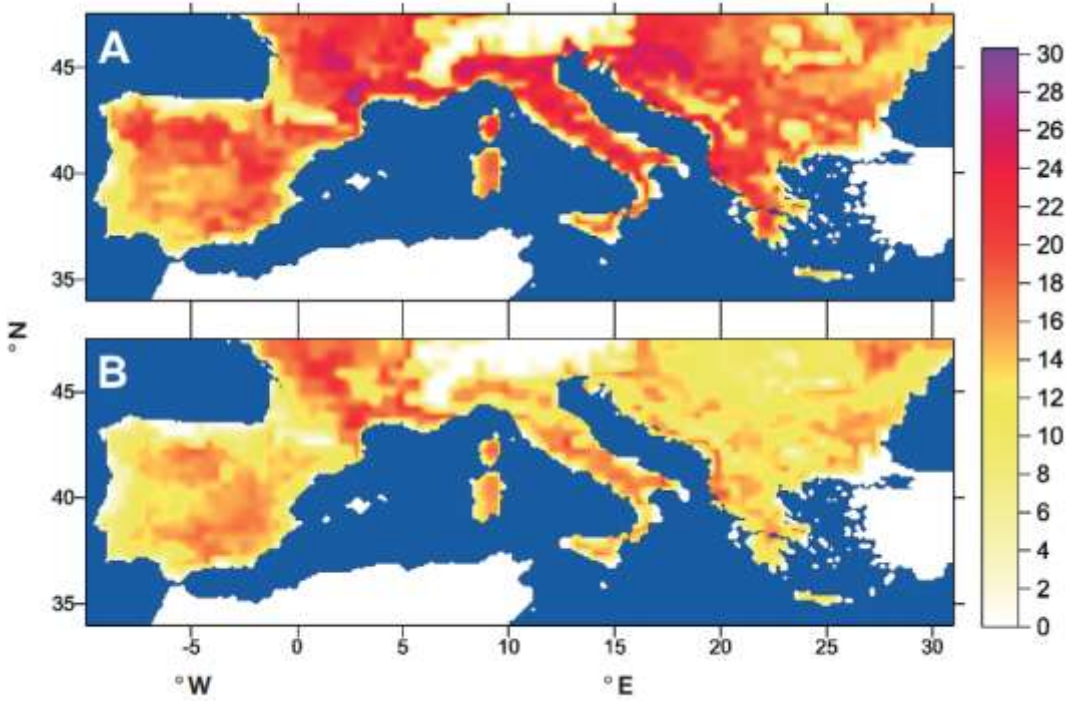


Fig. 11. Percentage changes of no. of days with FWI > 45 for (A) A2 and (B) B2 scenarios

- Increased mean fire danger
- Longer fire season
- Increased maximum daily fire danger
- More days with extreme fire danger
- More episodes of persistent (>7 days) extreme fire danger

Values threatened by ‘bad fires’

Wildland-urban interfaces

Rural communities safety and livelihoods

Commercial forestry

Mediterranean ecosystems: adapted and resilient to fire

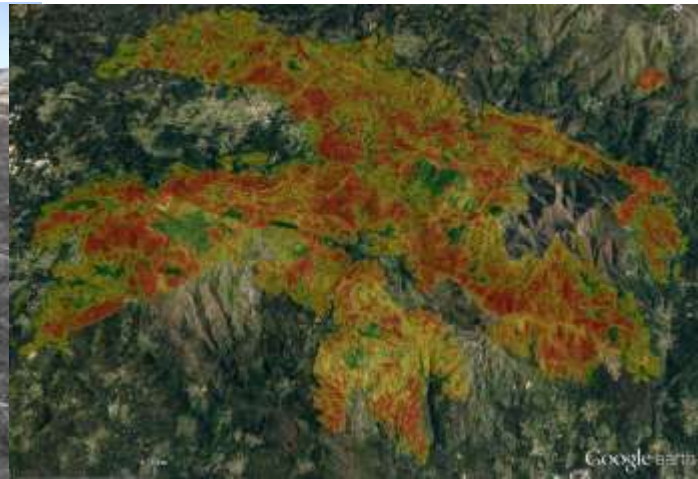
Strategies: individual (resistance - thick bark, self-thinning; vegetative response – sprouting) versus population (seeding)

Mediterranean ecosystems:
Adapted and resilient to fire, but not necessarily to all fire regimes

E.g. mountain pines, adapted to low severity, frequent fires

"Good fire" in hazard reduction: large fires are impacted by previous fires

- Wildfire spread constrained by pastoral burning
- Highly variable burn severity
- Unburnt islands and low/moderate severity associated to recent fires



Prescribed burning ("good fire") in hazard reduction

Untreated **13 yrs. after treatment**

Crown fire

Fireline intensity = 2000 –11000 kW m^{-1}

Tree mortality = 100%

3 yrs. after treatment **2 yrs. after treatment**

Surface fire

Fireline intensity = 200–1000 kW m^{-1}

Tree mortality = 41-55%

Prescribed burning ("good fire") in hazard reduction

Riserva Tirone Alto Vesuvio, Italy, 18 July 2017
Prescribed burnt vs. untreated *Pinus pinaster* stand

Battipaglia et al. (2017), Forest@

Prescribed burning ("good fire") in habitat management and nature conservation

Prescribed burning ("good fire") in habitat management and nature conservation

Finland

France

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Thank you!