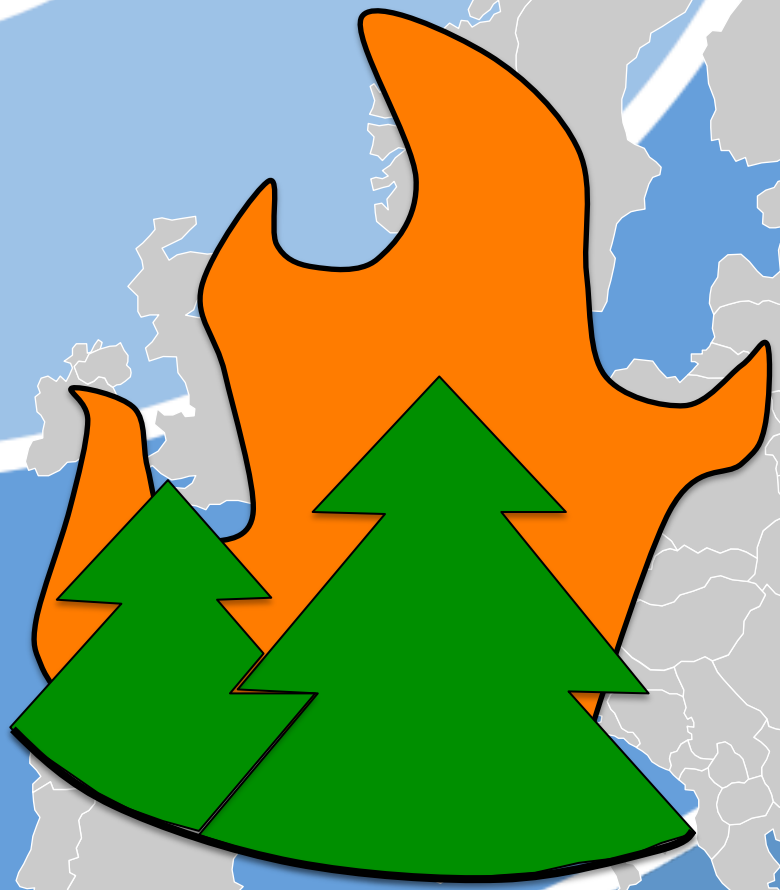
Europe's wildfires in a changing climate



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Wildfires

Past

Recent events

2010

The number of days with 'high or greater' flammability has noticeably increased in the central part of European Russia.
The 2010 fires killed many people and destroyed one-third of Russia's grain crop. Estimates of total economic losses due to the wildfires vary from $15 billion to $300 billion.

During the summer of 2003 more than 25,000 fires were recorded in Portugal, Spain, Italy, France, Austria, Finland, Denmark and Ireland. The estimation of EU forest areas destroyed reached 647,069 hectares.

2003

The 2003 wildfires resulted in a burnt area of land in Portugal corresponding to 13% of the total forest area in the country. Estimated damage exceeded 1 billion euros.

2007

In 2007 almost 9,000 fires have been recorded in Greece. On the southern peninsula of Peloponnesus the damage was estimated close to 3 billion euros. 68 people were killed, over 2,000 were injured. About 2 % of the total area of Greece had burned.

2017

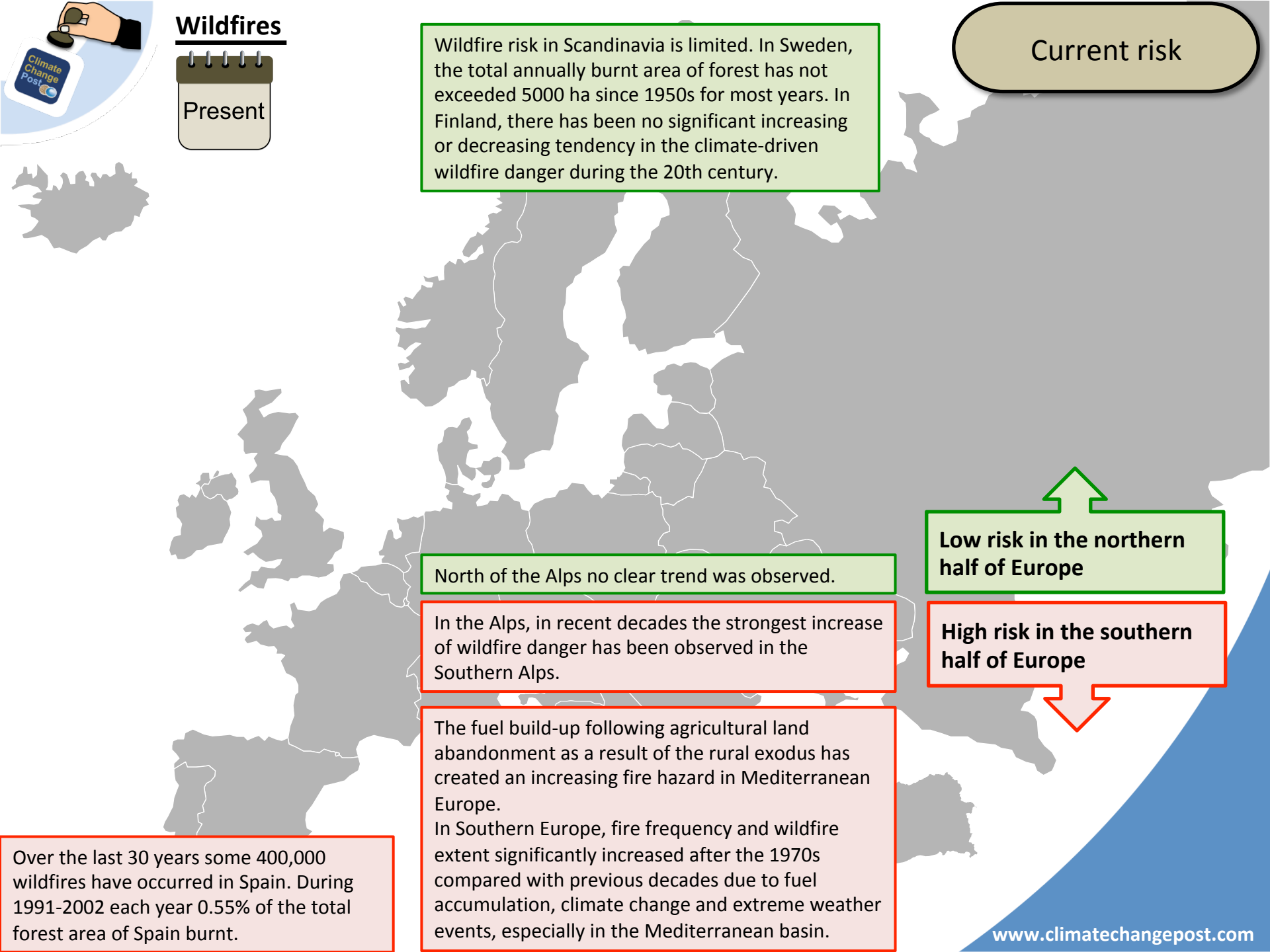
The 2017 wildfires killed 66 people in Portugal

Wildfires

Present

Current risk

Wildfire risk in Scandinavia is limited. In Sweden, the total annually burnt area of forest has not exceeded 5000 ha since 1950s for most years. In Finland, there has been no significant increasing or decreasing tendency in the climate-driven wildfire danger during the 20th century.



Low risk in the northern half of Europe

North of the Alps no clear trend was observed.

In the Alps, in recent decades the strongest increase of wildfire danger has been observed in the Southern Alps.

High risk in the southern half of Europe

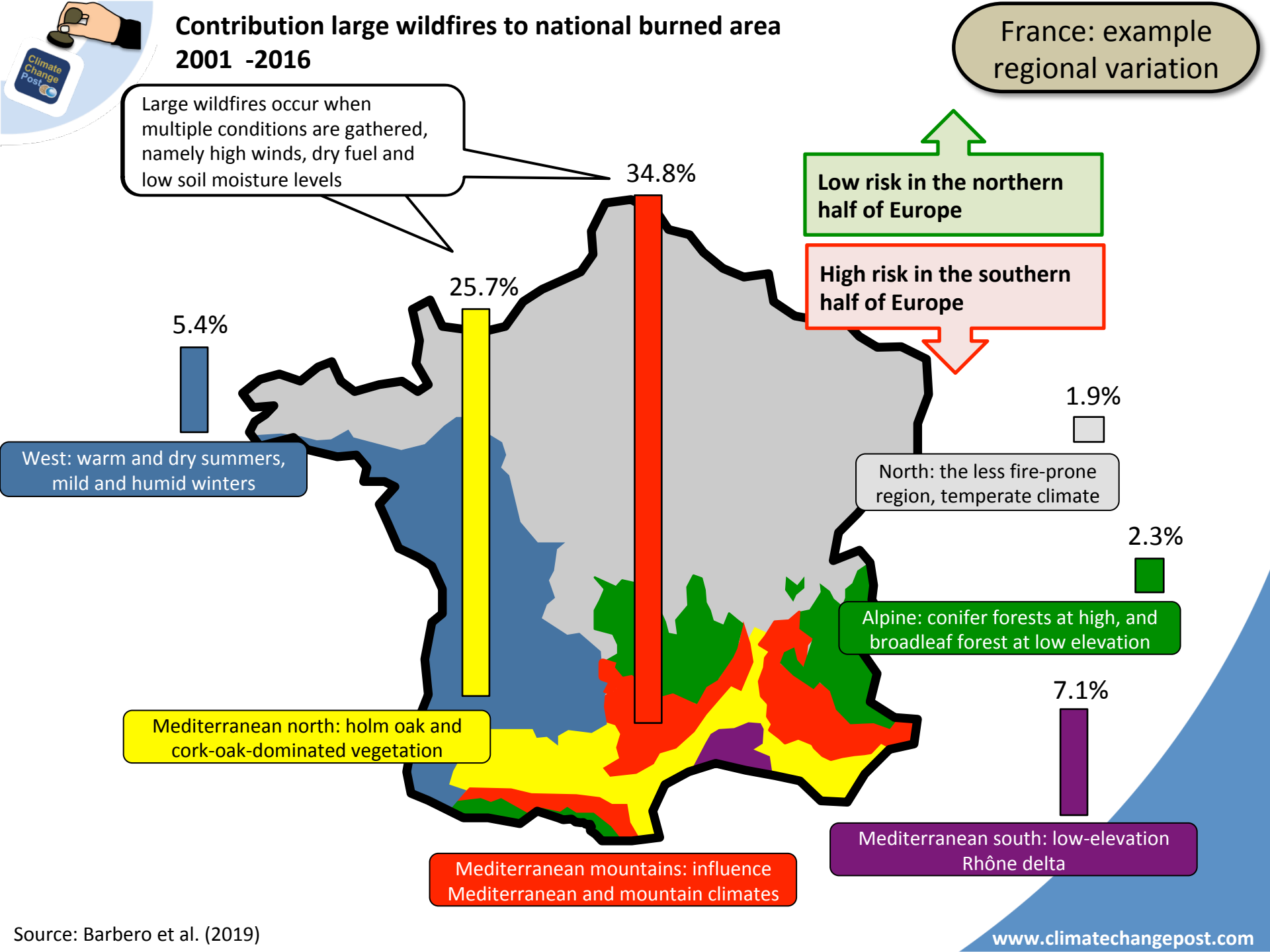
The fuel build-up following agricultural land abandonment as a result of the rural exodus has created an increasing fire hazard in Mediterranean Europe.
In Southern Europe, fire frequency and wildfire extent significantly increased after the 1970s compared with previous decades due to fuel accumulation, climate change and extreme weather events, especially in the Mediterranean basin.

Over the last 30 years some 400,000 wildfires have occurred in Spain. During 1991-2002 each year 0.55% of the total forest area of Spain burnt.

Contribution large wildfires to national burned area 2001 -2016

France: example regional variation

Large wildfires occur when multiple conditions are gathered, namely high winds, dry fuel and low soil moisture levels



Source: Barbero et al. (2019)

Wildfires

2050

Future risk

In Northern Europe, fires are projected to become less frequent due to increased humidity.

Hazard going up

Hazard going down

There will be 2 to 6 additional weeks of fire risk in most of the Mediterranean region. The maximum increase is inland, including Central Turkey, where at least an additional month with risk of fire is expected.

Future wildfire risk is projected to increase in Southern Europe, with an increase in the occurrence of high fire danger days and in fire season length.

Balkans, North Adriatic, Central Spain, North Italy and Central Turkey are the most affected regions.

The only part of the Mediterranean region with little change in fire risk is the southeast. Cyprus, the islands of Crete, Sardinia, Sicily and the Peloponnese see no increase or decrease.

Wildfires

2100

Future risk

Northern Sweden is likely to be a fire-resistant region in the future climate where the number of days with high fire risk is found to be lower than today.

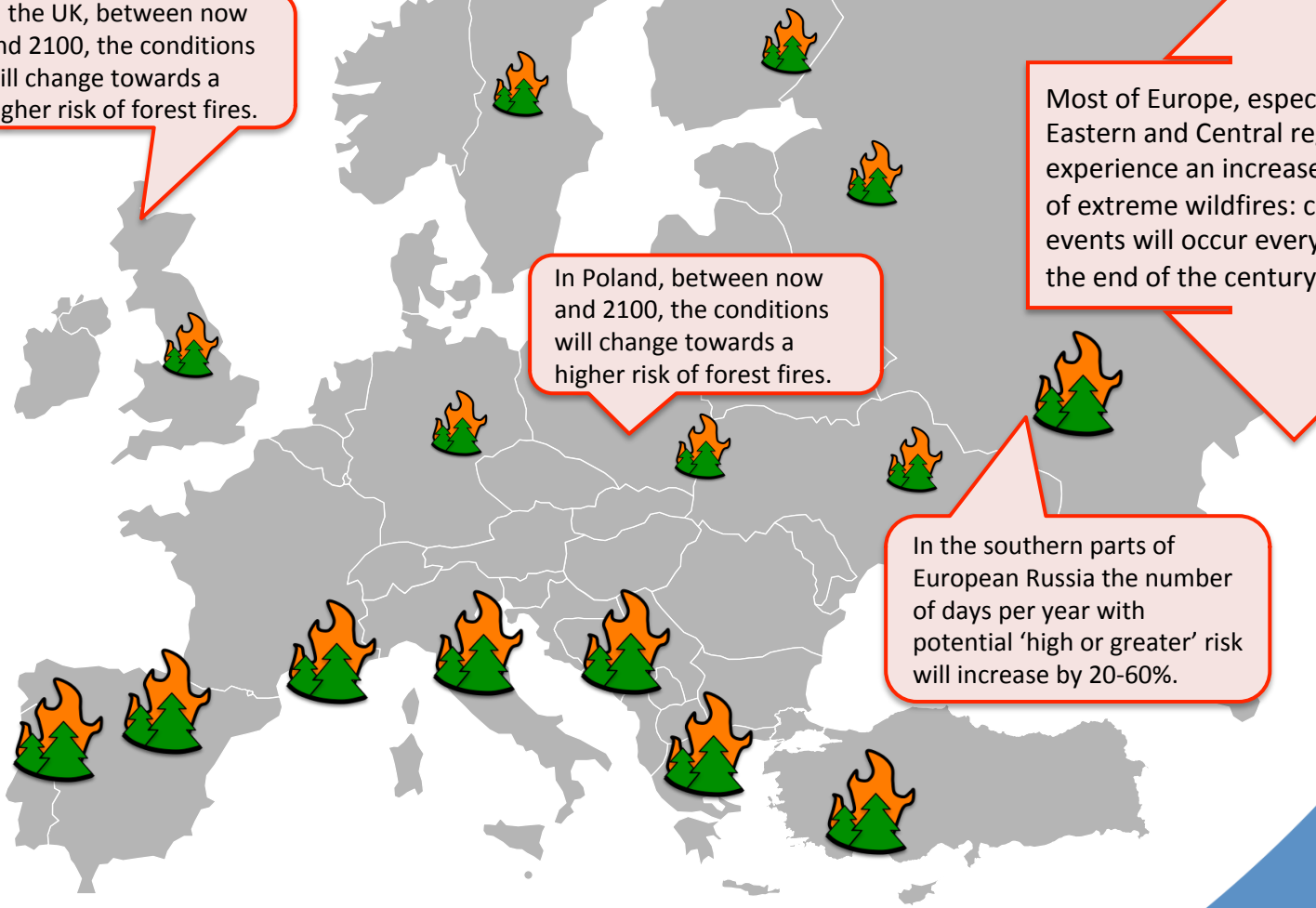
Southern Sweden is projected to become a more fire-prone region with an increased number of days with a high fire risk. In Scandinavia, on average, the number of wildfire danger days may increase by 7 to 10 days compared with 1961-1990.

In the UK, between now and 2100, the conditions will change towards a higher risk of forest fires.

In Poland, between now and 2100, the conditions will change towards a higher risk of forest fires.

Most of Europe, especially Western, Eastern and Central regions, could experience an increase in the frequency of extreme wildfires: current 100-year events will occur every 5 to 50 years by the end of the century.

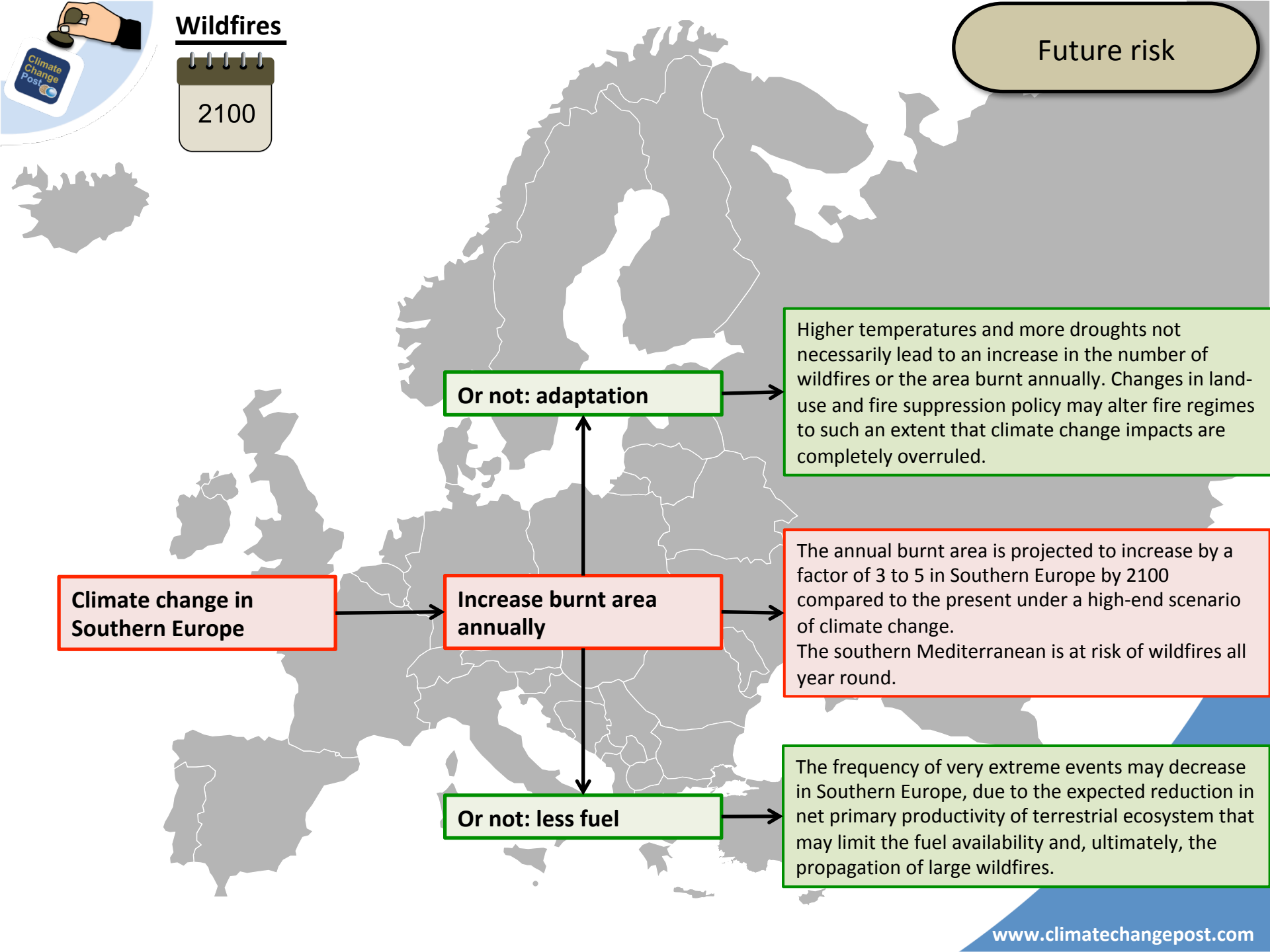
In the southern parts of European Russia the number of days per year with potential 'high or greater' risk will increase by 20-60%.



Wildfires

2100

Future risk



Climate change in Southern Europe

Increase burnt area annually

Or not: adaptation

Higher temperatures and more droughts not necessarily lead to an increase in the number of wildfires or the area burnt annually. Changes in land-use and fire suppression policy may alter fire regimes to such an extent that climate change impacts are completely overruled.

The annual burnt area is projected to increase by a factor of 3 to 5 in Southern Europe by 2100 compared to the present under a high-end scenario of climate change.
The southern Mediterranean is at risk of wildfires all year round.

Or not: less fuel

The frequency of very extreme events may decrease in Southern Europe, due to the expected reduction in net primary productivity of terrestrial ecosystem that may limit the fuel availability and, ultimately, the propagation of large wildfires.

Wildfires

Adaptation

There is a new generation of wildfires characterized by extreme behavior

New fire policy in France in 1994 to reduce the likelihood of very large wildfires. This policy is based on improved prevention of fires, increased surveillance of forests, and a massive attack on all ignitions in order to prevent fire enlargement.

Return period of large fires was quantified for southern France, for two periods: 1973 - 1994 and 1995 - 2016. New fire policy is successful for small fires, but not for large ones: likelihood of very large wildfires has not reduced.

Massive fire suppression cannot control all extreme wildfire events.

Source: Evin et al. (2018)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