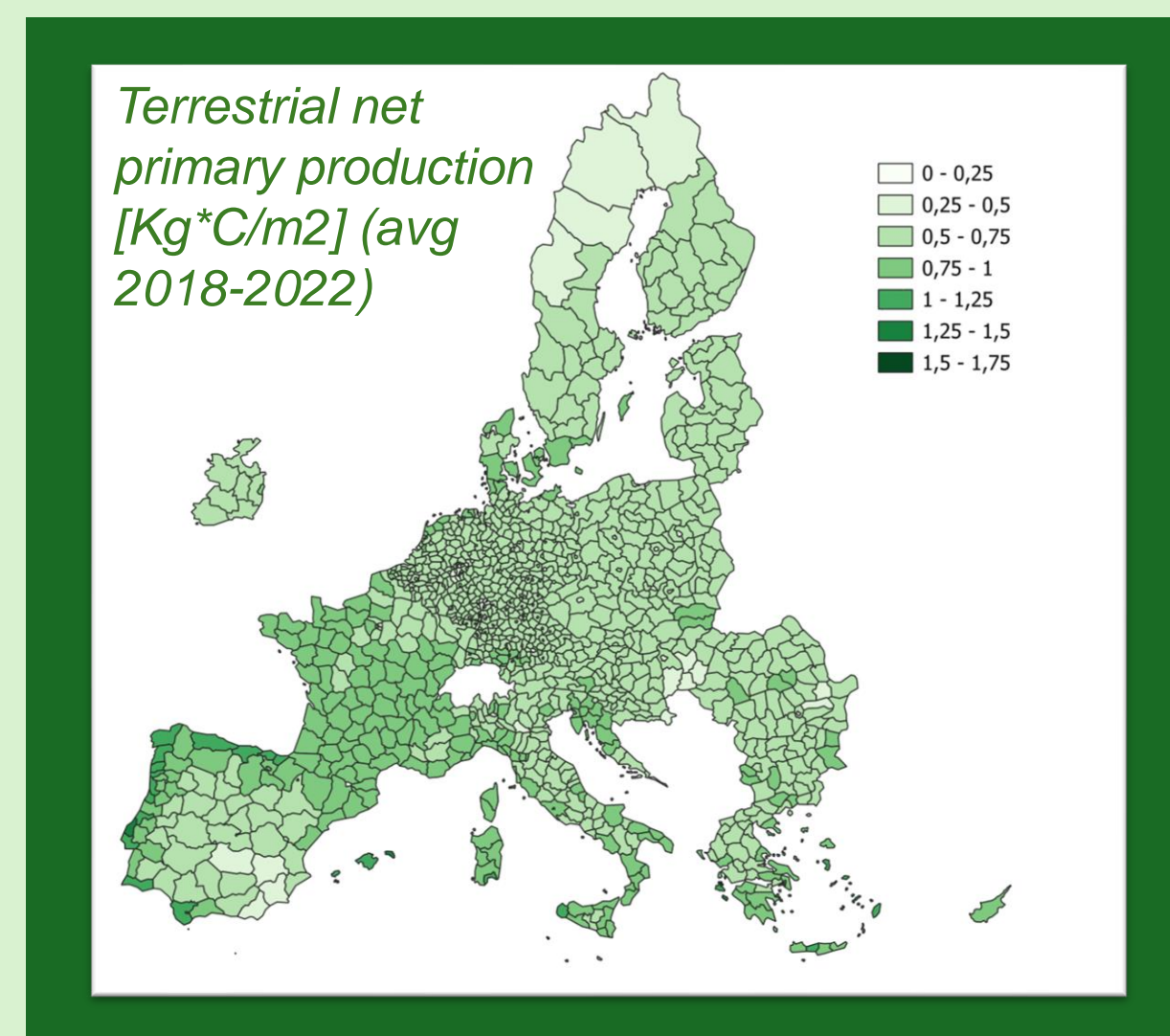
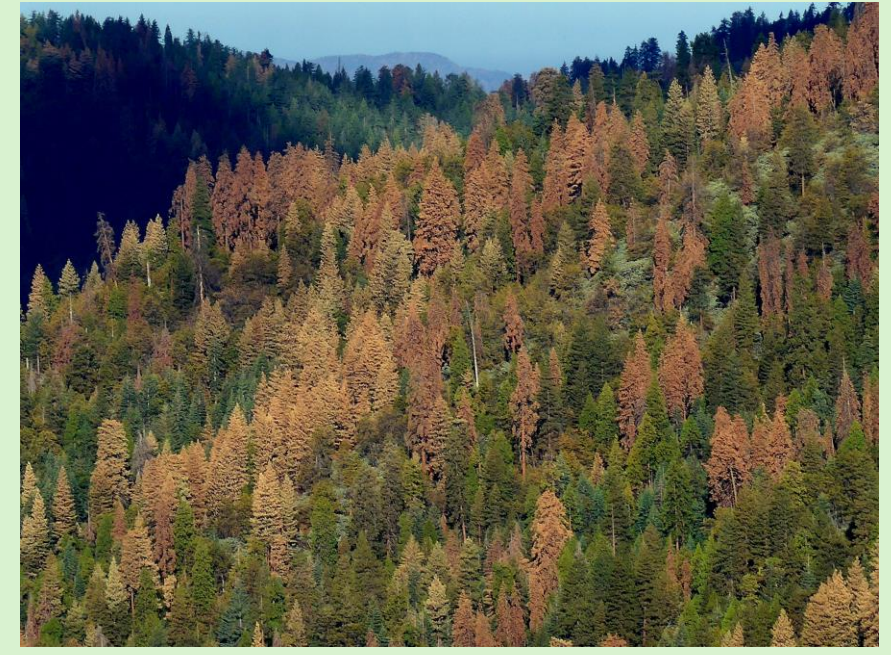


Drought Risks for European Ecosystems

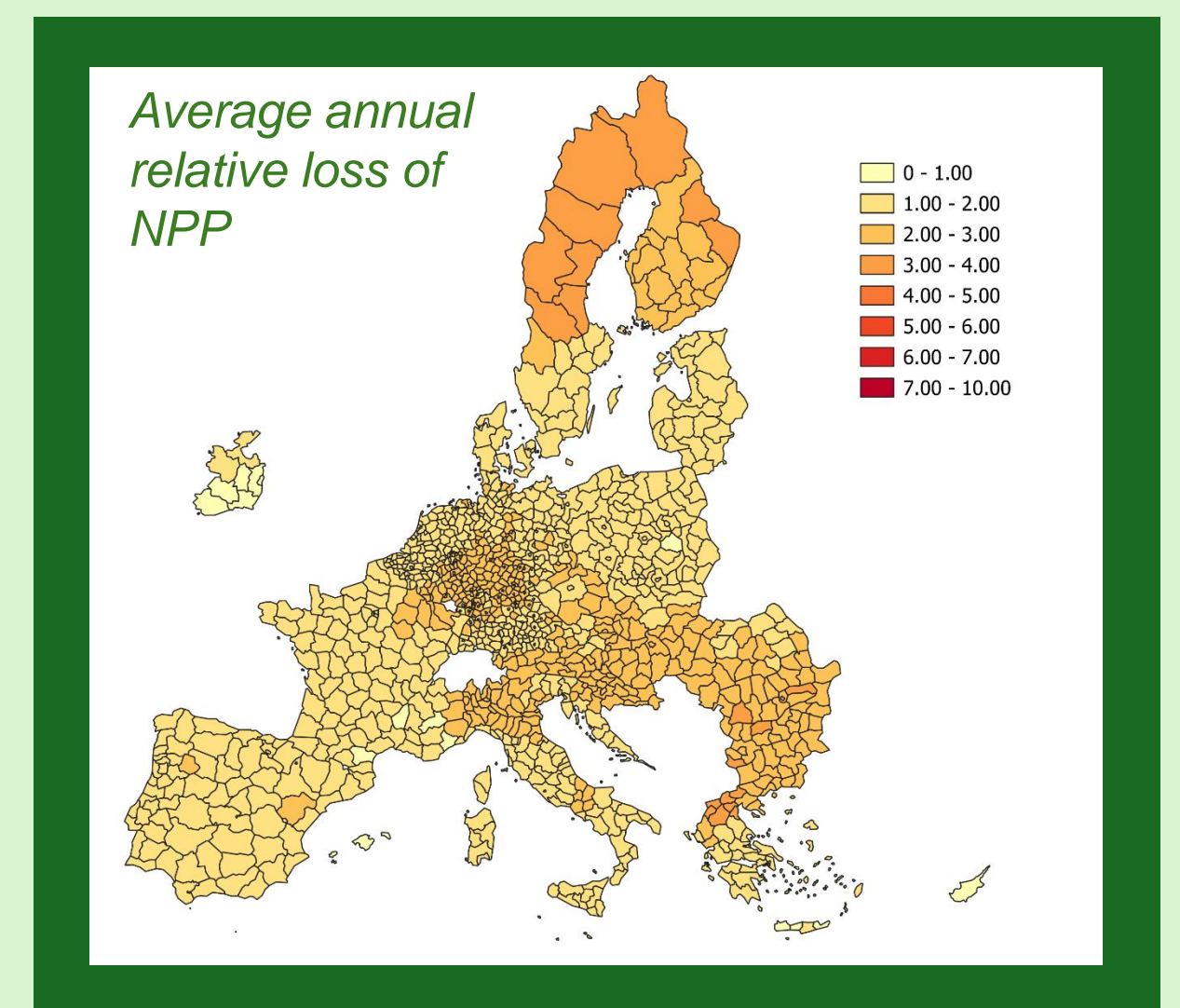
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Starting 2018, a record drought hit parts of Europe, stressing European forests. In 2021, more than 300,000 hectares of trees had died in Germany, ~2.5% of the country's total forest area. This was due to the negative response of plants to water stress, which can lead to the mortality of single trees, but also makes them more susceptible to other hazards, such as bark beetles. In addition to damaging the ecosystem itself, this dieback had economic consequences for timber producers, who rushed to sell their timber - for a lower price due to the high offer that was caused in the timber market. As a sector that generates €170 billion annually for Germany and employs 1.1 million people, the consequences of a decline in timber production in the country could reach beyond its borders: it might increase pressure for timber production elsewhere on the globe, contribute to the use of less-sustainable materials, such as concrete, or occur simultaneously to other timber crises [1].

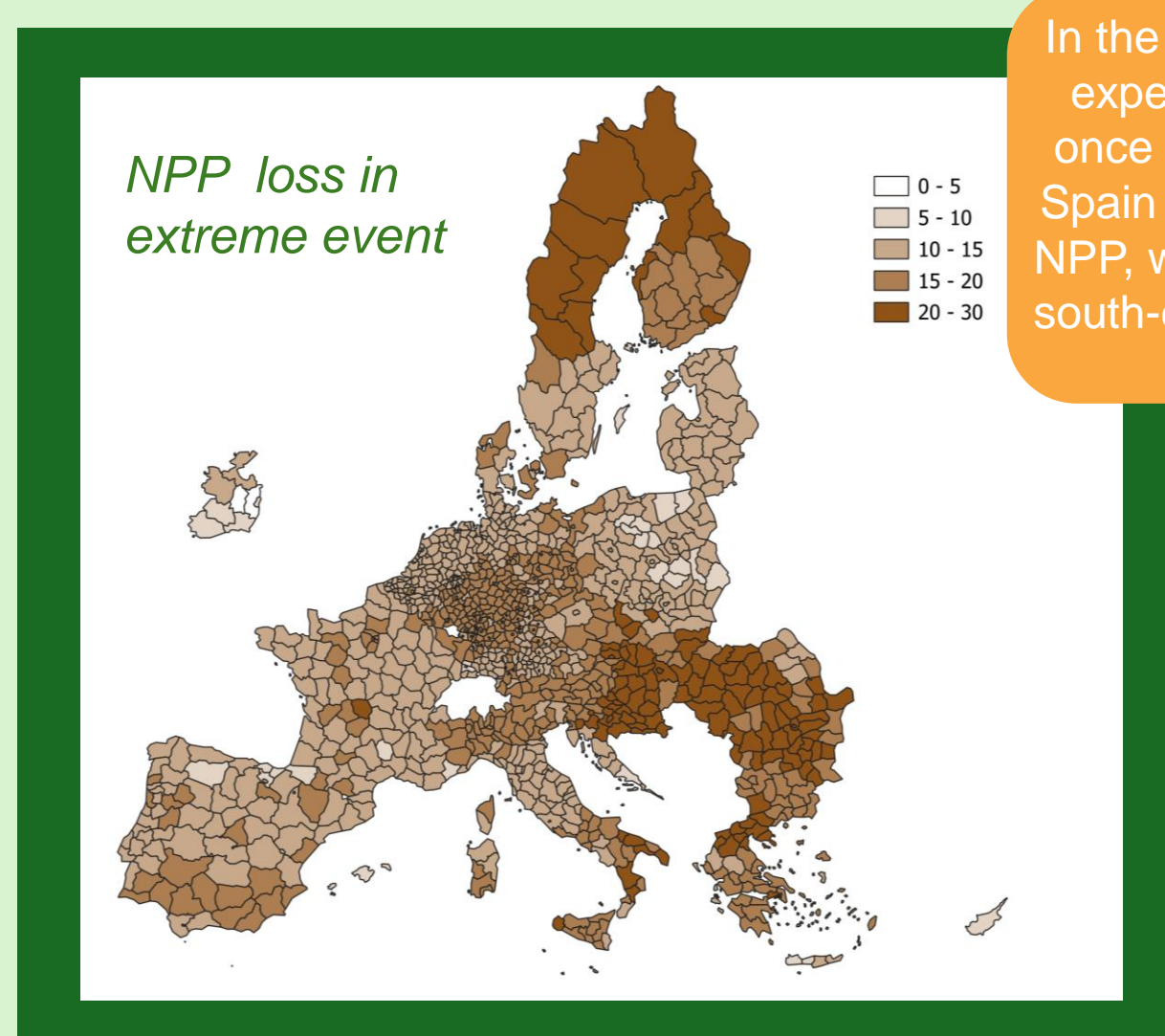
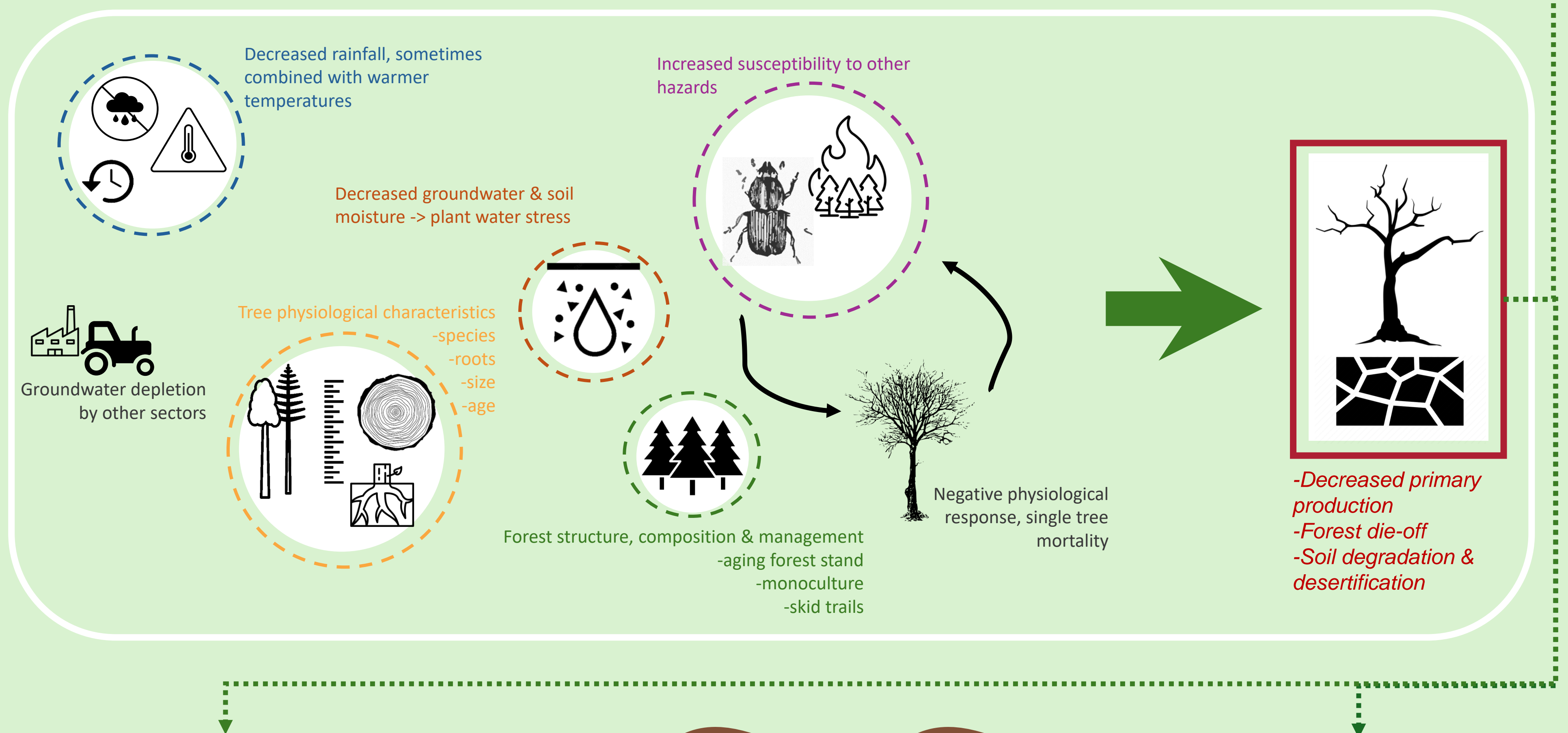


Primary production is the transformation of raw inorganic materials (CO₂, water, mineral nutrients) into organic carbon that is done by terrestrial plants via photosynthesis. The energetic and carbon-rich products of PP supply consumers, including humans, with fuel for their metabolism while providing essential compounds that can form living cells.

Northern Sweden and south-eastern Europe, and to a lesser degree north and south of the Alps, are the places with expected highest relative average annual losses.



How does it occur?



In the case of an extreme event, expected to occur on average once every 50 years, Southern Spain has losses of up to 20% in NPP, while Northern Sweden and south-eastern Europe might have losses up to 30%

Droughts exacerbate susceptibility to other hazards, such as pests and wildfires, creating feedback loops of decreased plant health.

The impacts of previous recent drought events can be carried over and influence the impacts of a new event. Some forests might not be able to cope with severe droughts and can reach a tipping point.

Under projected climate conditions, losses in the Mediterranean region will double or triple under 3 °C warming compared to the current risk. A decrease in losses is projected for northern Europe, but increased climate variability might play a role in losses.

