POPULAR SCIENCE SUMMARY

INFLUENCE OF LOCAL VEGETATION ON FIRE SPREAD MECHANISMS IN SURFACE FIRES

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Wildfires are posing an increased risk to communities, environment, and firefighters. Due to recent climate change this has become an emerging problem also in northern Europe. Within this work the influence of local vegetation on wildfire spread is analysed.

Understanding the wildfire behaviour and the influences of different parameters on the fire spread allows to predict the expected fire behaviour during incidents and inform the public in a timely manner.

As an increase in wildfires was identified in northern Europe in the past years it is important to analyse whether findings from other geographic regions are applicable or not. Thus, fire simulations based on a field experiment in Saxony-Anhalt, Germany, are utilized to analyse the importance of different parameters.

The vegetation in the simulation models is described by grassland in a pine forest. To not only account for the grass blades itself but also for the organic materials underneath the grass blades the combustible materials are modelled in different layers. The difference between the two layers is mainly the bulk density (i.e. ratio between fuel and air) as well as the moisture content.

The wildfires modelled within this work are surface fires. Thus, no tree crowns are involved in the fire. The main spread is caused by the grass blades. Furthermore, some burning after the main flame front passed is identified in the layer underneath the grass blades.

It was found that the amount of combustible material available and its moisture content are crucial for the rate at which wildfires are spreading.

These parameters are dependent on the local vegetation species as well as the typical climate. Thus, the simplified models from other regions might not be fully applicable to predict the spread rate of wildfires within this region. Further work in this field is needed, to be prepared for the coming years.