Using remote sensing to monitor peatland fire occurrence and recovery
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Introduction
Many peatlands in the UK are managed as grouse moors, using regular prescribed burns to encourage heather (*Calluna vulgaris*) growth. The remoteness and size of moorland areas can make fire occurrence difficult to monitor accurately, meaning that knowledge of burn frequency is limited. Aerial photography has previously been used by Allen et al. (2016) and Yallop et al. (2006) to detect managed burns, but is limited to relatively small areas. Satellite imagery covers much larger areas, but the spatial resolution of earlier satellites was too coarse to accurately detect the small burns typical of peatland fire management. Newer satellite sensors such as Sentinel-2 have much finer scale resolution and the advantage over aerial imagery of a frequent return interval and large scale coverage.

This study also considers the timescales of burn recovery, and how recovery may be related to annual weather patterns.

Results
The burn repeat intervals vary across the North York Moors, with some grid squares being burnt at intervals of less than 12 years. The area of fire-managed moorland burnt each year ranged from 2.11% (return interval of 47 years) in 2017-18, to 6.67% (return interval of 15 years) in 2016-17.

There appears to be some correlation between longer recovery times and hotter, dryer summers (calculated from ERA5 averaged over moorland area).

Future directions
We aim to extend this method to three other fire-managed moorland areas in the UK: the Yorkshire Dales, North Pennines, and the Peak District. Comparing the burn density and frequency across each of these areas will provide important information for conservation practitioners and policy makers. These additional datasets will also enable us to statistically analyse the potential correlation between hotter, dryer summers and longer recovery times, which we anticipate will give insight into fire-managed moorland resilience in a changing climate.

References

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