

Automated mapping of U.K. upland burning using Sentinel 2 imagery and Deep Neural Networks

Mike Shewring and David Douglas

RSPB

Abstract

Prescribed burning is widely used in the UK uplands to support gamebird shooting and to a lesser extent for grazing (Douglas et al. 2015; Davies GM et al. 2016). In the UK, upland heath and blanket bog ('moorland') often overlies carbon-rich soils and has internationally important conservation value. Prescribed burning in such habitats is contentious and there are concerns over its impact on carbon sequestration, water quality and habitat condition.

There is however little detailed information on spatial patterns in burning, the overlap with protected areas and soil carbon and, importantly, whether these patterns are changing (although see Douglas et al. 2015). This information is required to inform the development of policies for sustainable management and whether these are proving effective.

This talk will describe the development of an automated approach to mapping of prescribed burning in the UK uplands and present results. This work has been undertaken using temporal composite Sentinel 2 optical remote sensing imagery in a deep learning modelling framework using the Google Earth Engine Platform. Our top performing model has an overall accuracy of 96.7% providing good confidence in our predictions. We discuss the applicability of this approach to other ecosystems.

Keywords: Managed burning, Earth Observation, Remote sensing, Deep Learning