Geophysical Research Abstracts
Vol. 17, EGU2015-11570, 2015
EGU General Assembly 2015

Influence of a step-change increase of peat moisture content on the horizontal propagation of smouldering fires

Nuria Prat-Guitart (1), Claire M. Belcher (2), Rory M. Hadden (3), Guillermo Rein (4), and Jon M. Yearsley (1)

(1) University College Dublin, Earth Institute, School of Biology and Environmental Science, Ireland (nuria.prat-guitart@ucdconnect.ie), (2) University of Exeter, College of Life and Environmental Sciences,Department of Geography, UK, (3) University of Edinburgh, School of Engineering, UK, (4) Imperial College London, Department of Mechanical Engineering, UK

In shallow layers of peat, the transition between moss species causes a step-change of the horizontal distribution of peat moisture content. Post-fire studies in peatlands have reported shallow layers being consumed in irregular distributions. The unburned areas were found to be patches of wet *Sphagnum* moss. Our laboratory scale study analyses the effect of a horizontal step-change in moisture content on the spread of smouldering. We designed a laboratory-scale experiment (20×18×5 cm) within an insulated box filled with milled peat. Peat was ignited on one side of the box from which the smouldering fire horizontally self-propagates through a region of dry peat (MC_1) and then through a wetter region of peat (MC_2). An infrared camera, a webcam and thermocouples monitor the position of the smouldering fire spreading horizontally. The experiment was repeated with peats at different moisture content combinations to analyse the smouldering behaviour on a range of moisture content step-change conditions. The data analysis estimates the burned area and examines smouldering fire behaviour across a wide range of moisture content combinations reproducing realistic scenarios. We found that the area burned depends on peat moisture content before the step-change (MC_1) as well as the increase in moisture of the step-change itself (difference between MC_1 and MC_2). Our study assists in researching the influence of peat moisture content on the spread of smouldering in peatland fire and contributes to a better understanding of the post-fire peatland landscape, helping to reconstruct smouldering fire events.