**Realtime Wildfire Risk Mapping – briefing for Abdelrahman Ibrahim**

**Overview and Aim**

This project has been commissioned by the West Yorkshire Fire and Rescue Service (WYFRS) who will be our primary partner. A Project Advisory Group will be formed of Natural England (policy holders for land management), the Moorland Association (lobby group of landowners and managers), and academic experts. By the end of this 6 month project we would like to have an online mapping tool, that models a progression of spatio-temporal patterns of wildfire risk (ie not process-based models) that can be shared with WYFRS and other stakeholders involved in managing and responding to wildfires. Historical data will be used to develop the structures for the dynamic tool, as these can be tested against known past events. There are some outstanding issues that we expect to be resolved as the project develops and progresses, but below we have outlined a sequence of work that we believe can be realistically achieved within the timeframe.

**Approach**

Wildfires are complex hazards rooted in human and physical factors that have the potential to cause harm to people, property and ecosystems. Wildfire risk relates to the probability that it will cause harm and how serious that harm could be. Wildfire risk is composed of different factors that can represented by spatial layers and mapped in a GISA for example. Factors combine to generate measures of overall risk, and their contribution to overall risk can be weighted, and weights may vary for different users (e.g. WYFRS vs Natural England). The mapping tool will allow users to explore the risk maps that are generated under different weights.

**Work Part 1 (week 8)**

The first tranche of work will develop the online mapping tool framework for a case study area in the Peak District National Park. It will combine static data layers to generate overall maps of variations in risk and allow users to change the weights associated with factors.

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| **Work: Assemble Datasets** | **Issues to be decided** |
| * Elevation (slope and aspect) (OS Terrain5) * Geology (BGS) * Soils / Peat layer (BGS) * Land cover / land use (CEH LCM 2021) | * Study area: Specified West Yorkshire catchment in Peak District * The online tool platform, mapping functionality, database * Soils data and source of funding if NatMap from Cranfield |

The tool will be shared with the Project Advisory Group and WYFRS for feedback and suggestions for further factors to be incorporated into the tool.

**Work Part 2 (week 16)**

The second tranche of work will develop approaches for including dynamic factors associated with wildfire risk. These are the weather, specifically rainfall, as this drives soil moisture and vegetation dryness, and visitor patterns as wildfires are frequently started by people (as well as victims). This work will incorporate historical daily Met Office rainfall data and Strava / OS data visit data for a 2 year period, and historic fire incident data that records location of wildfire and vegetation type. Strava as an API (<https://developers.strava.com>) and OS has been contacted for access. IRS data has already been shared under data sharing agreement with WYFRS.

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| **Work: Assemble Datasets** | **Issues to be decided** |
| * Daily rainfall data * Daily visit data * Historic fire incidents from Incident Reporting System / Peak District Fire log data (<https://wildfirelog.co.uk>) | * Type and source of rainfall data   + Interpolation of rainfall data?   + IDW? Or with weighting? * Type and source of proxy visit data |

The tool will be shared with the Project Advisory Group and WYFRS for feedback and suggestions as before, but also with fire risk modellers to determine whether the tool can incorporate dynamic risk models in the future, and if so how its development in this project can be shaped to support that.

**Work Part 3 (week 22)**

The third part of the work will focus on Refinement and Analysis. It is anticipated that the tool will support the on-the-fly generation of datasets suitable to be downloaded by users for further statistical analysis. This could include for example, wildfire data for a particular location or time periods from the wildfire log linked to the specific factors associated with those fires at that time. This will require data and overlay, spatio-temporal filtering and downloading functionality in the tool backend.

The first draft of the research paper describing the work will also be created.