Wildfire Research @ Manchester

Atmospheric Aerosol Group Centre for Atmospheric Science

Contact: Professor Hugh Cross
Professor Gordon McFiggans, School of Earth, Atmospheric and Environmental Sciences

Activities:
- Measurements of deforestation fires, wildfires and domestic solid fuel burning and their associated effects on air quality
- Modelling of fire emissions in atmospheric models studying regional air quality & climate
- Investigation and modelling of the morphological and optical properties of soot particles, with relevance to climate
- Laboratory characterisation of wildfire emissions

Capabilities:
- Comprehensive suite of the latest instrumental techniques, covering composition and properties, suitable for field and laboratory applications
- Experienced staff who have developed their own analysis methodologies
- Access to and experience using the facility for aerosol measurements at Manchester Metropolitan
- Use of the ARM-West regional atmospheric model with dedicated HPC resources

Recent publications:
- Modelling of fire emissions in atmospheric models studying regional air quality & climate
- Investigation and modelling of the morphological and optical properties of soot particles, with relevance to climate

Fire physics and fire behaviour

Dr Jonathan Aylen, SEED

Fire physics research:
- Development of mesoscale fire models, incorporating fire dynamics and interactions with the atmosphere
- Investigation of fire growth, behaviour and spread in natural and managed environments
- Analysis of fire regime and fire danger

Knowledge exchange (KE)

Dr Gareth Clay, SEED

Knowledge exchange research:
- Development of knowledge exchange tools and techniques for wildfire risk management
- Engagement with stakeholders to facilitate the translation of research findings into practice

Radar monitoring of peat moorland burn scars

Julia McManus, Dr Clive Agnew, SEED

Radar monitoring of peat moorland burn scars:
- Use of high-resolution SAR imagery to monitor peatland fires andTheir effects on the landscape
- Investigation of fire growth and spread in peatland environments
- Development of techniques for monitoring post-fire rehabilitation

Geospatial analysis of wildfire risk

Julia McManus, Dr Clive Agnew, SEED

Geospatial analysis of wildfire risk:
- Use of spatial analysis techniques to map wildfire risk and its determinants
- Development of GIS models for predicting wildfire risk
- Analysis of wildfire data and their impacts on the landscape

Forecasting and Costing wildfire

Julia McManus, SEED

Forecasting and Costing wildfire:
- Development of models for forecasting wildfire risk and its impacts
- Analysis of wildfire data and their impacts on the landscape
- Development of tools for costing wildfire and its impacts

Relevant publications:
- Forecasting fire occurrence using daily weather data and Poisson statistical modelling
- Impact of climate change on wildfires in the Peak District
- Simulation of future wildfire scenarios (change models)
- Costing of wildfires incidents

Who we are:
Wildfire Research at the University of Manchester spans two Faculties and four Schools: School of Environment, Education and Development (SEED) and the Manchester School of Architecture, School of Mathematics and School of Earth, Atmospheric and Environmental Sciences (SAES) in the Faculty of Engineering and Physical Sciences. We also work with other institutions such as Manchester Metropolitan University (MMU), Solihull College, Kings College London (KCL), and stakeholders such as the Fire Service and land managers.