The ability to forecast fire outbreaks helps to reduce fire damage by fire watching, public warnings of fire risk and deployment of resources such as fire crews and temporary ponds.

Tim Donovan outlined the global and local models that underlie the Met Office’s weather forecasting system, including 70 levels of atmosphere at a spatial resolution of 4 km for the UK. This set of unified models underpins two sets of prediction models for fires. FireMet predicts the likely impact of a fire or chemical spill incident given weather conditions. The Fire Severity Index is a five day prediction system for wildfires in England and Wales. Public Weather Service advisors are also able to respond to a Category 1 incident with detailed advice taking account of factors such as topography and sunshine.

Jonathan Aylen outlined a statistical model for wildfire risk in the Peak District which takes account of both present and past weather conditions and the level of visits to the area. Key factors accounting for fires include current temperature and precipitation, dry spells and the level of visits to the Peak District. April and May are fire prone, especially bank holidays and weekends. Key issues were the portability of the model to other locations and the neglect of variables such as wind strength and direction and plant moisture.

As practising fire fighters, both Andy Elliott and Steve Yearsley pointed out that forecasts raise awareness of fire dangers and encourage deployment of extra fire fighting resources at times of high risk.

Evidence from Portugal suggested their fire danger index was quite reliable and widely broadcast on the media and the internet. Domingos said it was used to pre-position fire trucks, planes and helicopters. The threshold of danger varied from region to region. In some areas there were frequent small fires, but in others there were just a few severe fires. The fire danger rating needed to take account of these infrequent but severe fires. There are difficulties in predicting days of extreme danger which are not necessarily days of extreme weather conditions.

Andy Newman reported that the Met Office Fire Severity Index is used in West Yorkshire to back up what is already known. It provides confirmation of local information. One difficulty is that fire can break out in highly localised circumstances, for instance a fire that took place on the moors in very cold conditions due to a
discarded cigarette lighting “freeze dried” vegetation. In this case, the Fire Severity Index was 1. As a result, West Yorkshire are considering doing their own weather forecasts on a local scale.

Trevor Johnson pointed out that prediction systems can help with land management, discouraging muirburn at high risk times when managed fires might get out of control.

There was much discussion on the predictive success of the Fire Severity Index, with a suggestion from Colin Legg that the “fine fuel moisture code”, one component of the Index, might be a better predictor than the overall Index itself. In any case, the Index did not distinguish between the risk of fire and the likely severity of the resulting fire, echoing the issues in Portugal. Again John Dold raised the Haynes index of atmospheric stability which may be correlated with rapid growth in fires.

Responding, Tom suggested that, in principle, the Met Office could provide more information. The Countryside and Rights of Way Act had been the driver for developing the Fire Severity Index. It was now financed by Natural England and the Countryside Council for Wales. Natural England might support further developments.

Trevor concluded there is a need to compare statistical and meteorologically based prediction systems. Jon Walker pointed out that statistical models take account of human behaviour that caused fires. Rob Gazzard added that it would be useful to know fuel loadings too. Perhaps the legislation would evolve to allow further development of prediction models beyond the remit given by the Countryside and Rights of Way Act.

Finally, there was some discussion about climate change and wildfire models - could they help with obtaining funding for moorland fire-fighting resources? The key problem here is that it is not only the climate that is being projected forward. Land use is also particularly important, such as changes in vegetation type, onset of spring and moisture levels in vegetation. In addition, other considerations include increasing visitors and therefore sources of ignitions, resulting from indirect impacts such as policies for a low carbon economy and promotion of use of the countryside for health benefits.