Modelling the Distribution of *Culicoides* Bluetongue Vectors in North Wales

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Bluetongue (BT) serotype-8 emerged in northern Europe in 2006 and the UK initiated a vaccination campaign in 2007. With Wales accounting for 15% of all sheep within the EU community, incursions of BT could cause devastating production losses. To provide insight into the spatial distribution and density of BT vectors in Wales, satellite-derived climate variables, environmental and soil variables were analysed within a GIS.

Surveillance of *Culicoides* biting midges (CBMs) was carried out on 25 farms in Bala, north Wales, over 12 nights in July 2008. Environmental variables were assessed using a farm questionnaire and soil data was obtained from the National Soil Resources Institute. MODIS imagery from the NASA Terra satellite, including day/night-time land surface temperature, middle infrared reflectance, NDVI and EVI, was also obtained. High resolution (<1km) spatial regression models were built to investigate explanatory parameters for the CBM variation between farms. Models were produced for each midge species trapped, as well as a model for all species combined.

The *C.*obsoletus group, present on all farms, represented 62% of individuals trapped. The between-farm variation in catches was up to 200%. Models produced explain up to 88% of catch variation (species dependent). Only one model explained less than 50% of the variation (*C. festivipennis*; 23.28%). The *C. obsoletus* species (main BT vector in UK) model accounts for 85.5% of the variation. It includes the number of sheep on a farm and use of insecticides, alongside climatic variables.

Freely accessible climate and environmental data has proved beneficial in modelling CBM distribution. Quickbird satellite imagery and ordinance survey data are being assessed in terms of producing similar models for Bala and will be compared to the current models. Trapping at multiple sites per farm is being undertaken to produce higher resolution models of CBM density in relation to on-farm environmental variables.