STUDIES OF ACID DEPOSITION FROM THE UK POWER INDUSTRY

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It has long been established that the deposition of acid species can result in damage to sensitive ecosystems and this forms a strong regulatory driver for action to reduce the emissions of acid precursor species such as sulphur dioxide and nitrogen oxides. The UK electricity generators Joint Environmental Programme has developed a UK and European version of the USEPA Models-3/CMAQ system in order to meet the acid deposition modelling needs of the power generation industry. Models-3 is able to simulate the wet and dry deposition of acid species on an hourly resolution. In order to overcome the extensive run-times required to generate annual wet and dry deposition maps, an aggregation scheme was developed by UEA enabling single examples of periods of similar meteorology to be modelled and the multiplied up by their frequency of occurrence to generate the full annual deposition results. The aggregation scheme has been tested and applied to an annual study of the impacts of power station emissions on acid deposition in the UK. The impact of power station emissions on acid critical loads based on 1999 emissions has been assessed and found to be minor, with only one of the nine ecosystems being exceeded over greater than 1% of the total area, in contrast with the levels of exceedance due to all source emissions. A significant proportion of critical load exceedances due to power stations alone were found to be associated with low assigned critical loads, rather than high deposition values.