

Can Ellenberg numbers predict ozone sensitivity?

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There have been relatively few studies of ozone effects on semi-natural vegetation in comparison to crops and trees. It is impossible to screen all species for ozone response. Therefore, a method was developed to try and predict ozone sensitivity on the basis of Ellenberg Indicator values.

The model was developed using the OZOVEG database held at CEH Bangor which contains empirically-derived ozone response functions for 83 semi-natural species. The database defines Relative Sensitivity (RS) to ozone for a species as the change in above-ground biomass at an AOT40 of 15 ppbh relative to that at 3 ppbh (Hayes et al., submitted), where $RS > 1$ responds positively and $RS < 1$ responds negatively. Stepwise multiple regression (backwards elimination) was used to select the most appropriate combination of Ellenberg indicators to predict RS. Five equations were tested using jackknifing techniques, and a performance test which assessed the risk of misclassification of 'sensitive' species ($RS < 0.80$ or $RS > 1.20$).

The following equation was selected (details in bold, Table 2) for Predicted Relative Sensitivity (RSp):

$$RS_p = 1.805 - 0.118Light - 0.135\sqrt{Salinity}$$