

# Effects of ozone on a plant community exposed for two consecutive summers

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A model plant community, representing NVC U4 (*Agrostis capillaris*-*Festuca ovina*-*Galium saxatile* grassland) containing *Anthoxanthum odoratum*, *Agrostis capillaris*, *Festuca ovina*, *Carex echinata*, *Carex bigelowii*, *Potentilla erecta* and *Galium saxatile* was exposed to ozone in the solardomes at CEH Bangor for two consecutive summers. Eight solardomes, with 2 replicate domes of each of 4 treatments were used in 2004 and 2005. The treatments used represented current ozone climates and predicted scenarios for 2050. Two background ozone treatments were used, low background at 20-25 ppb ozone and high background (predicted for 2050) at 45-50 ppb ozone. In addition, an episodic ozone regime for four days every week was applied to each of the background treatments. The treatments were applied for twelve weeks in each summer.

Increased/premature senescence was observed on five of the seven species in the higher ozone treatments, and differences between the treatments were starting to show after 6-8 weeks of the first ozone exposure. There was most senescence in the high background-high peaks treatment in each case, and no differences in the sensitivity to ozone between the two years. Interestingly, *Festuca ovina*, had a significant increase in the rate of development of senescence in the high background-low peaks treatment compared to low background-low peaks, indicating that this species responded to the rise in background ozone concentrations tested.

There were no significant effects on biomass of component species or total mesocosm biomass in any one season, however cumulative biomass was reduced by 15% for *Anthoxanthum odoratum* in the high background-high peaks treatment ( $p=0.043$ ). In addition, after 2 seasons, the percentage cover of *Anthoxanthum odoratum* decreased from 53% (Low background-Low peaks) to 42% (High background-High peaks). There had been no differences in percentage cover between treatments prior to this.

Effects of ozone on this community were gradual, with some differences not present until after exposure to ozone for a second summer season.