ORAL PRESENTATION

THE ECOLOGICAL RESPONSE OF UPLAND LAKES IN IRELAND TO MULTIPLE STRESSORS: DIATOM PERSPECTIVES

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Afforestation has been promoted as an alternative to extensive agriculture in upland regions of Ireland but ploughing, fertilization and planting on organic moorland soils is likely have considerable effects on ecologically sensitive upland lakes. These lakes are also subject to changing sulphate deposition, DOC losses and temperatures. Given the lack of monitoring predating the initial afforestation in 1950s, it is difficult to evaluate how these multiple stressors impact on oligotrophic upland lakes. To define the extent of these impacts for a series of upland lakes in northwest Ireland, covering a gradient from complete catchment afforestation to control sites with no planting, we took sediment cores and used a range of palaeolimnological techniques (diatom and HPLC pigment analyses, ^{210}Pb dating and aquatic macrofossils) to describe recent trends in diatom diversity, dry mass accumulation rates, algal biomass, DOC and changes in macrophyte cover.

Diatom stratigraphic changes at these small upland lakes is remarkably complex and often pre-dates the start of afforestation. Unambiguous response to catchment fertilization was observed at only one site (increased abundance of *Asterionella formosa*). Other changes include recovery from natural (?) acidification (decline in *Tabellaria binalis*) and the increase of small *Cyclotella* spp, which is being increasingly observed in northern hemisphere lakes and probably reflects increased atmospheric nitrogen deposition. These species changes over the last 100-years preclude the application of transfer functions to infer a chemical variable, i.e. pH, DOC or nutrients and highlight the problems that can result from reducing ecological complexity to a single reconstructed variable.