Sky Room 6: 10:15 - 10:30

1.3.6 Carbon fluxes on a degraded lowland raised bog undergoing restoration with micro-propagated Sphagnum

Anna Keightley, Simon Caporn, Chris Field, James Rowson, Neal Wright

Anna Keightley, anna.keightley1@virginmedia.com Manchester Metropolitan University, Manchester, UK

Peatland Restoration
restoration, lowland, peatland, carbon, GHG, Sphagnum, micropropagation

Peatlands are a priority habitat for conservation in the UK, and an important carbon store. However, due to drainage for agriculture, urbanisation and more recently, peat-extraction on a large scale, more than 80% of remaining peatlands are damaged, and even protected peatlands are impacted, with the majority not in a favourable condition. Repair of UK peatlands is essential to promote recovery of associated vulnerable and marginalised flora and fauna, and as a tool to help combat climate change in the UK's ambitious carbon emissions reduction targets.

The site for this study is Cadishead Moss, an 8 ha fragment of an originally large lowland raised bog complex west of Manchester, previously drained and hand-cut for peat, then colonised by trees. The Lancashire Wildlife Trust has undertaken scrub removal and re-wetting for conservation purposes and the site is now mostly re-vegetated with Eriophorum angustifolium in wetter areas and Molinia caerulea in drier areas, and an increasing cover of Sphagnum mosses, mostly through re-introduction, as local source-material is scarce.

To demonstrate the benefits of restoration in terms of the change in carbon fluxes over time, carbon greenhouse gases (GHGs) were measured with a Los Gatos Ultraportable GHG Analyzer, fortnightly during the growing season and monthly during plant senescence, over a period of two years. Measurements were made via permanent collars inserted in to areas of naturally regenerating Eriophorum angustifolium and introduced Sphagnum material, micro-propagated through tissue-culture techniques, with control plots in Eriophorum-only and bare areas. Water table, plant growth, peat temperature and PAR were recorded concurrently.

It appears that re-wetting a degraded bog does not necessarily create large CH4 emissions, even with a cover of plants containing aerenchyma, but that CO2 emissions can be high in conditions of high temperature and low water table, although the carbon budget for the study site is still to be calculated. Measurements and subsequent modelling with local weather data are ongoing, but are expected to demonstrate the impact of peatland restoration methods on carbon fluxes and help steer management efforts towards improving the carbon sequestration function of recovering lowland peatlands.
"