Unique experiment set to reveal the effects of climate change on the forests of the future

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A major new decade-long experiment to study the impact of climate and environmental change on woodlands is launching today.

The Free Air Carbon Dioxide Enrichment (FACE) experiment at the Birmingham Institute of Forest Research (BIFoR) will assess the impact of raised carbon dioxide (CO2) levels on whole forest ecosystems by artificially raising the CO2 level around patches of mature woodland.

The results will help scientists to predict the effects of the atmospheric changes expected by 2050, and to measure the capacity of the forest to lock away carbon released by fossil fuel burning.

The BIFoR FACE facility is the first of its kind in Europe, and one of only three worldwide. The experiment will be the first to produce any concrete evidence about the ability of temperate woodland to mitigate future climate change. Multiple experiments will be run alongside the primary CO2 research project, looking at how raised CO2 levels are likely to affect the whole ecosystem, from leaves to soil and from insects to fungi.

Professor Rob MacKenzie, Director of BIFoR, says:

'BIFoR FACE is a technological marvel. Built into existing woodland without the use of concrete foundations or guy ropes, the facility gently delivers its enriched-CO2 atmosphere to 30-metre patches of 160-year-old oaks.

'The impact of changing CO2 should show up in the leaf chemistry of exposed trees within days, and in the soil within weeks. Within 3 years, stem growth, canopy structure, and a host of other structural forest elements should be different in the patches exposed to elevated CO2.

'Continuing out to 2026, the 'push' provided by the elevated CO2 will pass through all the checks and balances of a mature forest ecosystem, allowing, as each year passes, increasingly better estimates to be made of the extent and capacity of the land carbon sink in 2050 and beyond.'

Provided by University of Birmingham