

Last leaf fall

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NEWSLETTER OF THE BIRMINGHAM INSTITUTE OF FOREST RESEARCH



An oak is an oak is an oak

By distinguished visiting fellow Professor David Ellsworth



An oak is an oak is an oak, to paraphrase Gertrude Stein's 'Sacred Emily'. Or is it?

Many people see a forest as a uniform green wall, without much detail or texture. But scientists see much texture and variation, from tree-to-tree and top-to-bottom. Indeed some of that is belied by the trees themselves; tree stands are composed of high-performers – those that become large fast and show high growth – and the rest of the crowd.

This past summer at the BIFoR FACE Facility Site, Mill Haft, Norbury, Staffordshire saw the first large contingent of scientists collected to

study the properties of the woodland. We had colleagues from the UK and overseas all working alongside University of Birmingham colleagues. The scientific effort is ongoing, but this intensive campaign represented a baseline against which future changes induced by the free-air CO₂ enrichment (FACE) can be evaluated. It's important because elevated CO₂ will stimulate photosynthesis of the trees, and that 'extra' carbon could drive a host of other ecological changes, but we got a first estimate of the extent to which this may occur under summertime conditions. The overall photosynthesis in today's conditions was similar to that found for oaks in North America, but the FACE experiment is the first time that we can test how much this will change with rising atmospheric CO₂ at the level expected in the coming 35 years.

The team included **Professor Steven Sitch**, **Dr Lina Mercado** and **Dr Anna Harper**, from **Exeter University**, **Dr Deborah Hemming** from the UK Met Office, and **Dr Neil Loader** and **Dr Iain Robertson** from **Swansea University** as well as overseas from **Western Sydney University** in Australia myself and **Dr Kristine Crous**.

More backing for BIFoR

Following a visit to the BIFoR FACE facility in March 2015, alumnus John Horseman and his wife Moyra have very generously donated a second gift to the project, bringing their total donation to £150,000! We are extremely grateful to the John Horseman Trust for their support, which has been used to provide scientific equipment to support intensive baseline monitoring.



Coming soon

- 12 October 2015 – A chance to drop-in and hear more about the FACE project. 4.00–8.00pm, the Junction Inn, Norbury, UK
- 14 October 2015 – **Grown in Britain week**, Dr Jeremy Pritchard will give a plant biology Masterclass. See the website for further details.
<http://ow.ly/T0SkZ>
- 10 November 2015 – Unlocking the Benefits of Woods and Trees. A joint seminar with the Woodland Trust hosted by Prof David Maddison, Birmingham Business School.
<http://ow.ly/T0S70>

BIFoR FACE Facility

Mill Haft is now a hive of activity with construction works well underway.

- Shaylor Group's site compound is now complete including a biometric entry system which ensures the site remains safe and secure and allows for thorough induction of all persons on site. Access to the site has been formed including installation of incoming services and the formation of a tarmac access road. The new forest track is progressing very well, allowing other trades to access the FACE rings.
- Piling has commenced to the welfare units and the FACE rings with the steel grillages currently being assembled and carefully placed into position. These will form the bases to support the latticework masts that will form the 'FACE rings'.
- The position of the CO₂ pipework and services in the forest have been set out.

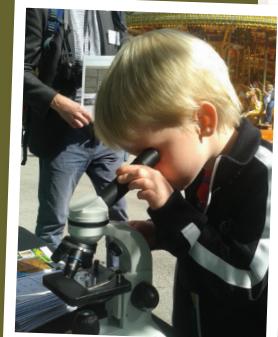
Approximately one thousand metres of pipework will carry CO₂ throughout the woodland. The components of the masts will be delivered to a field north of Mill Haft where they will be assembled. Once complete, these masts will be lifted by helicopter into the forest and placed into position.

- The BIFoR site received a high score at our most recent visit from the Considerate Constructors Scheme and has also been nominated for an award from our external Health and Safety consultants Building Safety Group.
- The design team meet fortnightly, enabling Shaylor Group, the University of Birmingham, BIFoR itself, and our subcontractors to ensure that this project runs to the highest of standards.



In the Community

Every year the University of Birmingham has a **Community Day**. Families in particular come to explore our beautiful, historic campus and enjoy events and activities. At the BIFoR stand children



enjoyed looking at some tree pests under the microscope and solving a plant pathology murder mystery: 'what was killing the mighty oak tree?' Children also used a full-size bow saw to make their own tree cookie, and to count the growth rings.

In the trees

In March, doctoral research students Emily Saunders and Nardie Hanson led a study of locomotion and decision-making in human climbers. Overseen by **Dr Jackie Chappell** and **Dr Susannah Thorpe** and aided by **Canopy Access Ltd**, they recorded how professional and recreational tree climbers moved around the canopy of an English Oak in Dorset, UK.

In comparing their data to those for our closest living relatives, the great apes, Emily and Nardie are developing insight into how bipedal locomotion and the complex cognition of our common ancestors evolved.



A participant reaches for a buzzer in the tree.

Leadership Fellows update

Ecocriticism

August: **Dr Louise Hardwick** contributed to a week-long international Summer School held at Wytham Woods on Ecoliteracy. To discover more about Louise's research, and why the Guardian compared her to Indiana Jones (!), see www.josephzobel.wordpress.com

History

June: **Dr Frank Uekötter** and Professor **Corey Ross** hosted international guests for a workshop on 'Making Resources Speak: themes and methods of the New Materialism'. Frank's latest book, *Deutschland in Grün*, sets in context current debates about the future of environmentalism. <http://ow.ly/TOTbI>

Water

May: **Dr Stefan Krause** and industry partner **Silixa**, generously facilitated and hosted by Norbury Estate, have installed the world's first fibre-optic cable for the sensing of soil temperature and moisture beneath a newly-planted mixed deciduous woodland adjacent to Mill Haft.

Stay in touch

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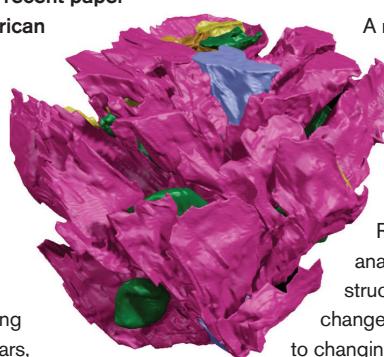
Phone: 0121 4146146

Website: www.birmingham.ac.uk/bifor

Research highlight: conifer evolution

Dr Jason Hilton is a palaeobotanist and evolutionary plant biologist providing a deep time perspective to BIFoR. Below, is a taste of his recent paper in the prestigious American Journal of Botany.

Fossil seed-cone provides insight into evolution of modern conifers



The conifer clade has a rich fossil record extending back over 300 million years,

yet our understanding of crown-group conifer evolution has been constrained by a lack of well-preserved fossils.

A mid-Jurassic locality on the Isle of Skye, Scotland, has yielded a seed-cone that constitutes the earliest anatomically preserved evidence for the diverse conifer family Cupressaceae. Results are now being analysed to see how the structure of conifer cones have changed through time in response to changing environments and climate.

