

## Post-doctoral researcher: **Combined plant hydraulics and xylem growth in a global dynamic vegetation model**

**Background** The project PHydrauCC researches the interactions between tree growth and hydraulic traits under ambient and elevated CO<sub>2</sub>, using data from Free-Air Carbon dioxide Enrichment (FACE) facilities. To determine the resilience of trees under changing climatic conditions, it is imperative to know whether elevated CO<sub>2</sub> will affect the structure of wood and the physiological traits conferring drought- and heat-tolerance. Plant hydraulic traits describe the efficiency and safety of xylem water transport through roots, stems, branches, and leaves. It is unknown how growth variations under rising CO<sub>2</sub> and a changing climate will affect those traits.

**Aim** This postdoc of PHydrauCC will assess forest resilience to future climate change on continental scale under the dichotomy of the very different hydraulic strategies of conifers and broadleaved trees. A hydraulic and tree-ring formation model, developed in another workpackage, will be adapted and incorporated in a dynamic global vegetation model. We expect that the new combined model of tree-ring formation and plant hydraulics will display hysteresis and legacy effects in plant growth for several years after major drought and heat wave events. Drought-related risks under climate change in temperate and boreal forests will be evaluated, with a special interest in the different hydraulic strategies of broadleaved angiosperms compared to needle-leaved gymnosperms.

**We are looking for an enthusiastic researcher able to work with and develop large-scale vegetation models based on partial differential equations, who is motivated to study legacy effects in forests in response to major drought events.**

The successful candidate will work closely with [Matthias Cuntz](#) and [Emilie Joetzjer \(UMR Silva\)](#) located in [Nancy](#), France, and with the other members of the project [PHydrauCC](#) such as [Jean-Christophe Domec](#), [Jérôme Ogée \(UMR ISBA\)](#), and [Cyrille Rathgeber \(UMR Silva\)](#), another postdoc, and several students.

### **Requirements**

**PhD in suitable fields (physics, ecophysiology, global change biology)**

**Strong programming skills (e.g. Fortran, Python)**

Good spoken and written English language skills

Ability to carry out independent and well-organised research, as well as work as part of a team

Interest in ecophysiology, forest functioning and/or biogeochemical cycles

**Location:** [UMR Silva](#) Nancy (Champenoux) France

**Contract duration:** 12 + 36 months

**Starting Date:** the position is available from October 2022 and will remain open until filled

### **Contacts**

Matthias Cuntz – [matthias.cuntz@inrae.fr](mailto:matthias.cuntz@inrae.fr)

Emilie Joetzjer – [emilie.joetzjer@inrae.fr](mailto:emilie.joetzjer@inrae.fr)

**How to apply** Applicants should submit a complete application package by email to the contact above. The application package should include (1) a curriculum vitae including a publication record, (2) statement of motivation, (3) names, addresses, phone numbers, and email addresses of at least two references.