PhD opportunity in below-ground biodiversity and forest soil functioning

As part of a recently funded BIODIVERSA project, **SoilForEUROPE,** the Chairs of Geobotany and of Silviculture at the University of Freiburg invite applications for a 3-yr joint doctoral position focusing on the role of below-ground tree diversity for ecosystem functioning.

Project description: A main goal of the SoilForEUROPE project is to determine the relationships between tree species diversity and soil biodiversity, and their consequences for ecosystem functioning across major European forest types. This subproject is concerned with the role of fine-roots and their decomposition for soil biodiversity and ecosystem functioning. Like the other subprojects, it will analyse and sample forests with different tree species diversity from distinct European forest types (boreal, temperate, mediterranean).

One major task of this PhD project is to analyse the soil occupation by fine roots. Soil processes and the diversity of soil organisms are likely related to the fine-root surface and its energy and element exchange with the rhizosphere. Owing to differences in species-specific fine-root traits and properties, we hypothesize that the total fine root surface and spatial occupation of soil is higher in tree mixtures than in monocultures. Consequently, the diversity and functioning of soil organisms may be related to the diversity in tree fine-root traits. In addition to quantifying the belowground spatial niche occupation in tree monocultures and mixtures, the PhD candidate will determine key fine-root traits related to soil occupation and to diversity of other soil organisms.

The second major task is related to the decomposition of fine roots. Decomposition of dead organic matter is a key ecosystem process largely controlled by environmental conditions and the diversity and composition of the decomposer community, but often also the number and functional characteristics of litter species. Litter mixtures often decompose faster or slower than what would be expected based on single species decomposition. Whether similar mixture effects occur for decomposing roots is not well known. The PhD candidate will quantify decomposition rates of tree fine roots of different chemical and morphological characteristics in tree monocultures and mixtures and identify the relative importance of above- and belowground plant traits, as well as indices of soil fauna diversity and environmental conditions for root decomposition.

Candidate profile: We are looking for a highly motivated and co-operative person with a strong background in forest and soil ecology, environmental science, or related fields.
The ideal candidate will have demonstrated his/her ability to successfully carry out relevant research, data analyses and communicate the results. Experience in publishing in scientific journals is desirable. The applicant should be able to independently plan and undertake field sampling. Prolonged periods working in the field at different sites in Europe are required. A strong statistical background and experience with R is desirable. A strong command of English is indispensable. For international candidates, knowledge of German (or a willingness to learn) would be beneficial during fieldwork and to enhance the experience of living and working in Germany.

Salary is the German standard for doctoral students (TV-L E13 65%) and a starting date in February 2017 is anticipated. The University of Freiburg is an equal opportunity employer and encourages women to apply. For international candidates, the University of Freiburg offers support with the logistics of relocating to Germany (http://www.welcomecenter.uni-freiburg.de).

Founded in 1457, the University of Freiburg is one of the oldest German universities and now one of the nation's leading research and teaching institutions. Freiburg is a vibrant student city at the foot of the Black Forest in close vicinity to France and Switzerland, with a rich cultural and academic life and excellent recreational opportunities.

Your application will consist of a letter of motivation, a CV, academic transcripts (non-official copies are acceptable), and contact details of at least two academic references. Please send your application as a single PDF by email with the subject "PhD position in SoilForEUROPE" by November 31, 2016 to Ursula Eggert (ursula.eggert@waldbau.uni-freiburg.de). Questions regarding the content of the project may be addressed to Profs. Scherer-Lorenzen and Bauhus (michael.scherer@biologie.uni-freiburg.de, juergen.bauhus@waldbau.uni-freiburg.de).