

The Professorship for Land Surface-Atmosphere Interactions at TUM School of Life Sciences
Weihenstephan invites applications for a

PhD position in phosphorus cycle modelling

E13 TV-L, 65%, for 3 years

About us

The professorship “Land Surface-Atmosphere Interactions” at the Department of Ecology and Ecosystem Management investigates impacts of global climate change on terrestrial ecosystems and potential feedbacks at regional and global scale, specializing in plant-nutrient interactions, and impacts from land use change and droughts. For more information, see <http://www.lsa.zw.tum.de>.

You will be a member of the TUM Graduate School and work in an international project team that aims to advance our current understanding of phosphorus feedbacks by bridging the gap between observational-based ecology and ecosystem modelling. You will work with a newly developed version of the dynamic global vegetation model LPJ-GUESS which includes detailed processes of the phosphorus cycle. You will work in the team of Prof. Anja Rammig in collaboration with partners from the LPJ-GUESS developer team at Lund University, Sweden and experimentalists from INPA Manaus, Brazil.

Your profile

- Full university degree (Diploma/M.Sc.) in Earth Science, Ecology, Computer Science, Mathematics, Geo-Ecology, Environmental Science or a related discipline.
- Sound programming skills applied to ecosystem modelling and strong interest in developing dynamic global vegetation models is essential, experience with object oriented programming (preferably C++) is considered an advantage.
- Knowledge in soil science, ecology and vegetation dynamics is beneficial.
- You should be able to communicate concepts and results in fluent English, and we expect you to be dedicated, independent, creative and a responsible team player.

Tasks

The functioning and the resilience of the terrestrial biosphere, and in particular forest ecosystems, in the light of global climate change is of great uncertainty, among other factors due to the unclear role of phosphorus (P) feedbacks in the system. The availability of P, especially when it is limited, may strongly influence the forests ability to act as a carbon (C) sink due to elevated atmospheric carbon dioxide (CO₂), i.e. the CO₂ fertilization effect. Global dynamic vegetation models are progressively incorporating P feedbacks but profound mechanistic understanding of the key P-related processes in tropical soils and plants are currently lacking. Tropical ecosystem responses to climate change and eCO₂ are therefore poorly constrained by ecosystem models.

You will address uncertainties in P cycle constraints on the CO₂ fertilization effect by 1) using available data to increase mechanistic understanding, and 2) translate those into ecosystem model(s) to improve the representation of P cycle processes. Together with the international team, you will apply, evaluate and further develop the dynamic global vegetation model LPJ-GUESS for soil P cycling based on existing data. LPJ-GUESS will be employed to assess the P control on the CO₂ fertilization effect at larger scale. Overall, the proposed work will advance our understanding of P control on the terrestrial carbon sink, which is essential in predicting its response to global change. Upon completion, you will have gained expertise in observation- and model-based ecosystem ecology and be part of a diverse international research team.

Our offer

We offer a stimulating working environment in an interdisciplinary research team with the opportunity to contribute to existing projects (see www.lsa.zw.tum.de). Funding for the position are according to the conditions of employment follow the rules of the German tariffs of public services (TV-L E13, 65%). Funding for travel, conference visits, stays abroad and personal development is available. TUM is an equal opportunity employer. Qualified women are therefore particularly encouraged to apply. Applicants with disabilities are treated with preference given comparable qualifications.

Contact

Please send your application as a single PDF file, including a cover letter, CV, certificates, and contact information of two referees, before September 15 to Dr. Andy Krause (andy.krause@tum.de). For more information on our group and current projects, please see www.lsa.zw.tum.de.