

## **Profile for an Assistant Professor (UD) position in climate-vegetation dynamics**

The Institute for Biodiversity and Ecosystem Dynamics (IBED) has research expertise in Earth, environmental and ecological sciences, and plays a leading role in several important teaching programmes with a strong Earth-system focus, including the BSc Future Planet Studies and the MSc Earth Sciences. To strengthen scientific expertise, and the delivery of numerical and computational education within these degree programs, IBED is seeking to recruit an established educator and researcher specializing in mechanistically (physically based) modelling of climate-vegetation dynamics.

### **Background**

The trajectory of current, and future, climate change is a fundamental concern for humanity with far reaching consequences for planet Earth. Developing a robust understanding of the connections between (anthropogenic) climate change, ecosystems and societies is crucial for predicting and mitigating the adverse consequences of climate change. The mechanistic modelling of climate-vegetation dynamics can increase our understanding of the role of climate-vegetation-Earth system feedbacks. Linking such models to empirical data sets to validate them against past, and on-going, change is an important step for model validation and enhancing understanding of Earth-systems. Expertise in modelling climate-vegetation dynamics complements existing expertise in climate-vegetation and Earth system dynamics in the Department of Ecosystem & Landscape Dynamics (ELD). We are looking for a scientist who can use an Earth-system frameworks to link together key aspects of ongoing empirical research into key themes such as: desertification, agricultural capacity building, drought impacts, long-term vegetation assembly and sustainability.

### Current scientific themes within the ELD department comprise:

- *Desertification:* How do degrading dryland ecosystems respond to ongoing and future changes with respect to land use and land cover, soil quality, water availability and climate? What does this mean for ecosystem functioning and services, and landscape process response, and how can we use this knowledge for mitigation and adaptation strategies? ELD researchers use digital mapping (drones) and field observations to enhance our understanding of dynamics in dryland ecosystems (Erik Cammeraat).
- *Agricultural capacity building:* How can we optimize different ecosystem services of agricultural soils, such as food production and climate change mitigation via carbon sequestration? How do we devise sustainable land management strategies that reconcile state-of-the-art soil scientific insights with the practical needs and knowledge of farmers, in particular in the Global South? ELD researchers work with local stakeholders (farmers, foresters, etc.) to unravel biogeochemical processes key to carbon and nutrient cycling in the soil (Boris Jansen)
- *Drought impacts:* Which vegetation and soil properties determine ecosystem response to drought and what are the implications for ecosystem functioning? How are these responses affected by other disturbances such as land use change or nitrogen deposition? And how can we use this knowledge to make both managed and natural ecosystems more resilient to climate change? ELD researchers work to understand the mechanisms and consequences of agricultural and natural ecosystems to drought, and other extreme climatic events (Franciska de Vries)
- *Long-term vegetation assembly:* How did ecosystems function in the absence of human interference? What are the key factors driving vegetation and landscape change over centuries or millennia? Exploration of the past vegetation and climate through the analysis of proxies extracted from sedimentary records is a key way in which empirical evidence for answering these questions can be generated. ELD researchers work on past vegetation-climate-human interactions on timescales of hundreds to millions of years, using proxies such as pollen, charcoal and fungal spores to investigate past vegetation, fire and animal dynamics (William Gosling).
- *Sustainability:* How can we meet societal needs while staying within the social-ecological limits of the Earth? How can we achieve a transformation from resource management to sustainable governance of Earth's social-ecological systems? In our increasingly globalized and urbanized societies, human-nature relationships are mediated by infrastructure and institutions, which often obscure the link between human actions and ecosystem dynamics. ELD researchers work to develop strategies in social-ecological-technological systems (SETS) contexts that

unravel these links and provide human livelihoods in locally and globally sustainable ways (Elisabeth Krueger).

Additionally, research takes place in the Department of Theoretical and Computational Ecology (TCE) where the interpretation of atmospheric dynamics, synoptic weather conditions and climate play an important role and where collaborations would be welcome:

- Occurrence & distribution of species integrating expertise on climate dynamics (Daniel Kissling)
- Bird flight behaviour and bird movement (Judy Shamoun-Baranes, Emiel van Loon)
- Use of radar systems (a.o. the operational European meteorological radar network) for aeroecology (Judy Shamoun-Baranes).

Through recruiting an expert in climate-vegetation dynamics we also anticipate being able to enhance our education at both the BSc and MSc level in relation to the functioning of climate systems, uncertainty behind climate projections, and link this to the consequences for the sustainability of human activity.

#### Key educational involvement

- *BSc Future Planet Studies (FPS)*: This interdisciplinary degree program brings together students from both social science and natural science backgrounds. The aim of this degree program is to produce graduates who are equipped with the skills to tackle fundamental societal problems, such as sustainability, climate change and biodiversity loss. The successful applicant for this position will be responsible for the delivery and enhancement of the “Climate change and sea-level rise” course within FPS and will contribute to other aspects of the program, such as supervision of student research projects. For further information: <https://www.uva.nl/programmas/bachelors/future-planet-studies/future-planet-studies.html>
- *MSc Earth Sciences (ES)*: This scientific degree program is themed around global change and attracts students from around the world. The aim of this degree program is to produce graduates who understand how the Earth's complex systems function, how these changes changed in the past, and what the consequences of future change might be for ecosystems and a sustainable future. The successful applicant for this position will be responsible for delivery and enhancement of the “Climate change” course within ES and will contribute to other aspects of the program, such as the supervision of student research and literature review projects. For further information: <https://www.uva.nl/en/programmes/masters/earth-science/earth-sciences.html>
- *MSc minor program “Science for sustainability” (SfS)*. This minor program is delivered by the Science Faculty and can be taken in conjunction with a number of MSc degrees. The purpose of the minor is to help students to apply their knowledge to solving societal problems by combining with economic and political issues. The successful applicant for this position will contribute to the climate science aspects of this minor. For further information: <https://gss.uva.nl/masters-programmes/science-for-sustainability-minor/the-science-for-sustainability-minor.html>

#### **What are you going to do?**

The successful candidate will perform cutting edge research in developing climate-vegetation models integrating both abiotic and biotic components of the Earth-system. Dependent on the expertise of the candidate, the emphasis may lie on different temporal and spatial scales, e.g. on a regional, continental or global scale; or combine across them. The successful candidate will be able to demonstrate an ability, and enthusiasm, to collaborate with experts already within the institute generating empirical data on related subjects, i.e. have an interest in data-model validation.

You are expected to:

- Contribute to education within the MSc Earth Sciences (ES) and the BSc Future Planet Studies (FPS) programs. Specifically, taking a leading role developing and enhancing the “Climate Change” (ES) and “Climate change and sea-level rise” (FPS) courses.
- Contribute to the cross-disciplinary MSc minor “Science for Sustainability”, alongside more social science facing colleagues (Elisabeth Krueger).
- Supervise research projects and literature reviews at BSc and MSc levels.
- Publish in high level international journals, present at leading conferences, and supervise PhD researchers.

- Contribute to the development and execution of world-leading research into the consequences of global change in ELD and other IBED-departments
- Attract external funding to sustain and expand your research line.
- Actively pursue collaborations with relevant stakeholders inside and outside academia.

The overall balance of the work load for this position will be approximately 50% education, 40% research, and 10% administration. The educational component will include the delivery of educational material, co-ordination of courses, and the supervision of BSc and MSc student projects. The research component will include conducting research, writing and submission of manuscripts and grants, and the supervision of PhD researchers. The administrative component will include organizational roles within the institute, such as participation in hiring committees or as a department representative on an internal committee. It is envisaged that over the medium term (c. 4-5 years) the successful candidate will develop their career by obtaining an advanced educational qualification (such as the SKO) and become an educational leader within the organization. This trajectory will include taking up educationally focused administrative roles, such as becoming the co-ordination of an MSc track and/or a member of an examination board. In the longer term the successful candidate may rise to become the director of one of our educational programs.

### **What do we require?**

The successful candidate for this position will have:

- A PhD in modelling of climate-vegetation dynamics or climate dynamics, or a closely related field.
- Strong didactic skills, as evidenced by a track record of delivering university education on climate science and in numerical/computational skills.
- A qualification in university education (equivalent to the Dutch “University Teaching Qualification” BKO); or willing to obtain the BKO within the first 1-2 years of appointment.
- A track record of publishing in international peer reviewed journals and obtaining external research funding.
- Experience of supervision BSc, MSc and PhD researchers.
- Fluency in English and in Dutch; or willing to learn Dutch to a level appropriate for teaching in Bachelor programmes taught in Dutch.
- A collaborative outlook on science and be able to demonstrate how they can link with the ELD (IBED) team.
- A driven personality who can serve as a role model for students as well as junior lecturers and junior researchers.

### **About the Faculty of Science and the Institute for Biodiversity and Ecosystem Dynamics**

The Faculty of Science has a student body of around 7,000, as well as 1,600 members of staff working in education, research or support services. Researchers and students at the Faculty of Science are fascinated by every aspect of how the world works, be it elementary particles, the birth of the universe or the functioning of the brain.

The Institute for Biodiversity and Ecosystem Dynamics (IBED) is one of eight research institutes of the Faculty of Science. The research at IBED aims to unravel how ecosystems function in all their complexity, and how they change due to natural processes and human activities. At its core lies an integrated systems approach to study biodiversity, ecosystems and the environment. IBED adopts this systems approach to ecosystems, addressing abiotic (soil and water quality) and biotic factors (ecology and evolution of plants, animals, and microorganisms), and the interplay between those. The IBED vision includes research encompassing experimental and theoretical approaches at a wide variety of temporal and spatial scales, i.e. from molecules and microorganisms to patterns and processes occurring at the global scale.

### **Questions?**

Do you have questions about this vacancy? Or do you want to know more about our organisation? Please contact: Dr. William Gosling ([w.d.gosling@uva.nl](mailto:w.d.gosling@uva.nl)), Head of the Department of Ecosystem & Landscape Dynamics.

**Job application**

The UvA is an equal-opportunity employer. We prioritize diversity and are committed to creating an inclusive environment for everyone. We value a spirit of enquiry and perseverance, provide the space to keep asking questions, and promote a culture of curiosity and creativity.

Do you recognize yourself in the job profile? Then we look forward to receiving your application, including a motivation letter, a CV, a short teaching statement (<750 words), a short research statement (<750 words), and a list of publications.

The interview will include a example lecture (30-minutes) given to a general audience, including students, and a panel interview. At the start of the panel interview you will be asked to give a 10-minute presentation outlining your key scientific interests and your fit to IBED and ELD.