Positions available - Changing Seasonality of Vegetation and Birds in the Greater Cape Floristic Region

We seek several students to join our NRF ACCESS funded "Seasonality in the Cape" project exploring the impacts of changes in rainfall seasonality on vegetation and birds in the global biodiversity hotspot of the Greater Cape Floristic Region (GCFR). Changes in seasonality of rainfall might have profound impacts for this highly diverse and endemic vegetation in the only winter-rainfall dominated region of sub-Saharan Africa.

Our project will combine large-scale outdoor experiments with remote-sensing and citizen science data across the GCFR to tackle this issue. Opportunity exists for the development of key skills in: field experimental approaches, collecting and analysing physiological, demographic and community data, ecological remote sensing and data analysis.

Hons bursaries are for 1 year at R65 000 p.a.
MSc bursaries are for 2 years at R90 000 p.a.
PhD bursaries are for 3 years at R120 000 p.a.

We seek students/staff to fill the following positions:

1)   Seasonality and C_4 grass establishment in winter rainfall areas (MSc or PhD)
This project will explore the potential of C_4 grasses to invade the shrubby biomes in the GCFR under altered seasonality. Taking primarily a field experimental approach, grass growth, recruitment and success will be explored under altered precipitation seasonality at Drie Kuilen Private Nature Reserve in the western Langeberg mountains. Linkages between grass ecophysiology and remote sensing, using UAVs ('drones') and satellite-based products could also be investigated, depending on the student's interests. This project would suit a student eager to develop skills in field-based experimental plant ecophysiology and remote sensing.

Skills required: good knowledge of plant ecophysiology, experimental design and setup, willingness to work in a remote field site for a number of days at a time, good data analysis skills (preferably using R, or with knowledge of another programming language), some knowledge of GIS will be useful.

Supervised by: Vernon Visser, Adam West, Res Altwegg

2)   Seasonal drought physiology and remote sensing of biodiversity (MSc or PhD)
This project will examine the components of fynbos biodiversity that are most sensitive to seasonal drought. Using a combination of remote sensing, vegetation survey and ecophysiological ground-truthing, this project will link plant-level ecophysiological measurements on the ground with UAV ("drone") and satellite observations of plant performance. This project would suit a student eager to develop skills in UAV and satellite-based remote sensing and analysis coupled with field-based vegetation survey and plant ecophysiological monitoring.

Supervised by: Adam West, Jasper Slingsby, Res Altwegg

3)   Birds' responses to seasonality (MSc or PhD)

This project will examine the seasonal dynamics of bird distributions across South Africa using the Southern African Bird Atlas data. Our country is rich in bird species that respond to seasonal availability of resources by moving around. Some species migrate between lower and higher altitudes, some are nomadic and some leave the country altogether for times of the year. How is climate change affecting these strategies? This project is largely desktop based and focuses on analysing existing data with state-of-the art statistical models. However, some fieldwork component could be envisaged.

Supervised by: David Maphisa, Res Altwegg

4)   Modelling the relationship between streamflow and precipitation (MSc)

There is a complex relationship between spatially and temporally varying precipitation (intensity, seasonality, timing with respect to previous rainfall events) and observed streamflow. Using long-term streamflow and climate data from Jonkershoek, the aim is to develop a multivariate time-series model linking streamflow to precipitation. One aim of the model is to determine the relative influence of precipitation versus groundwater release and evapotranspiration on streamflow. Related to this, the project aims to contribute to our understanding of the relationship between precipitation and runoff versus infiltration. Such a model could be used for predicting how streamflow is likely to be affected by projected changes in precipitation seasonality.

Supervised by: Birgit Erni, David Le Maitre

To apply, please send us:
● an application letter explaining your motivation to join our team (please clearly specify with position(s) you are applying for),
● your CV, including a list of publications and/or conference presentations,
● academic transcripts,
● a copy of your post-graduate theses (MSc if applying for PhD), and
● names (and contact details) of two academic references who have taught, supervised or worked alongside you.

Having completed an MSc (not MTech) is a requirement to be able to register for a PhD in UCT's Science Faculty. These bursaries are from the NRF and cannot be held in conjunction with another NRF bursary.

Key dates
Applications: Send your application to Sue Kuyper (Sue.Kuyper@uct.ac.za) by **14 October 2018**.
Interviews: **29-31 October 2018**
Student positions start date: **1 February 2019**

For more information, please contact the relevant supervisors for each project:
Res Altwegg (res.altwegg@uct.ac.za)
David Maphisa (d.maphisa@sanbi.org.za)
Vernon Visser (vervis@gmail.com)
Jasper Slingsby (jasper@saeon.ac.za)
Adam West (adam.west@uct.ac.za)

The University of Cape Town reserves the right to: disqualify ineligible, incomplete, inappropriate and/or late applications, and to change the conditions of award or to make no awards at all. Allocation of the student bursaries is subject to approval from the NRF, in line with their equity targets.