

# SPACES II

Science Partnerships for the  
Adaptation to Complex Earth System  
Processes in Southern Africa



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Federal Ministry  
of Education  
and Research

## SPACES II Newsletter No. 1 / Dec. 2019

### Welcome

#### Welcome to the First SPACES II Newsletter!

SPACES II (Science Partnerships for the Adaptation to Complex Earth System Processes in Southern Africa) is a research programme funded by the German Federal Ministry of Education and Research (BMBF) and partners in South Africa and Namibia. Five terrestrial and four marine SPACES II projects focus on the complex interactions between atmosphere, biosphere, land and sea in and around southern Africa. The aim of all projects is to produce science-based policy recommendations for Earth system management, sustainable use and preservation of ecosystem services in the region.

The aim of this Newsletter is to inform our SPACES II project partners, collaborators, stakeholders and all interested parties on our past, present and future activities. With this first issue, we would like to invite comments and suggestions for improvement, to be able to find a format which works best for all. Many thanks to everyone for the numerous contributions to this first issue!

We hope you enjoy reading!

*Mari Bieri & Elisabeth Schulz*  
Contact: [mari.bieri@thuenen.de](mailto:mari.bieri@thuenen.de)



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## Fieldtrips (1/6)



Photos: Jon Sheppard



## ASAP fieldtrip to Western Cape

In September 2019 researchers from Uni Freiburg, Karlsruhe Institute of Technology and ZALF as part of the ASAP project visited the Western Cape region hosted by the University of Stellenbosch. The team installed climate stations, water flux sensors, collected soil samples and used terrestrial laser scanning equipment for high resolution measurements of windbreaks. Further analysis of all the data gathered within the fieldtrip continues in Europe. The visiting research team thank Prof Ben du Toit and team for their support.

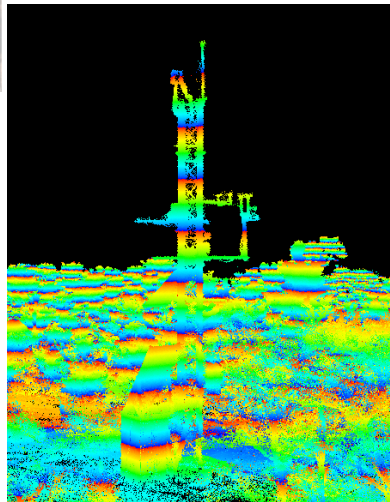




## Fieldtrips (2/6)



Fig. 1. Malopeni flux tower point cloud.  
Fig 2. Field trip group.  
(Photos: Christian Berger, Jussi Baade)



## SALDi/EMSAfrica remote sensing field trip

*Christian Berger & Jussi Baade, Friedrich Schiller University Jena*

In September and October 2019, researchers of the SALDi and EMSAfrica projects, from the FSU Jena and the German Aerospace Agency (DLR), joined forces to conduct extensive field campaigns in South Africa. One group was busy checking the soil moisture equipment installed in March in all six study sites and validating the first results of remote sensing time series analysis. Other group members conducted surveys of dried-out and water-filled reservoirs in collaboration with Dr. H. Cawthra from the Council of Geoscience using Terrestrial Laser Scanning (TLS) on land and echo sounding from a boat. Another task was to conduct rainfall simulation experiments on agricultural land in the Free State in collaboration with the Agricultural Research Council (ARC) and the University of the Free State, Dr. Le Roux, as well as in SANParks Kruger National Park, Mpumalanga, in order to calibrate a physically based erosion model.

Finally, extensive terrestrial laser scanning (TLS) surveys at the EMSAfrica eddy covariance flux tower sites were conducted in Middelburg (Eastern Cape), Agincourt (Mpumalanga), Skukuza and Malopeni (both Kruger National Park, KNP). The obtained TLS data consist of billions of 3D points that allow for an accurate characterization of vegetation on the sites investigated. They will be employed within the two projects to calibrate and validate satellite-based retrievals of a range of vegetation parameters, including fractional cover, canopy height and aboveground biomass. The figure below provides an example of the 268 million laser points acquired at the Malopeni flux tower with each color cycle representing 1 m in height.

The work in Middelburg, Agincourt and KNP was substantially supported by Dr. Justin du Toit of the Grootfontein Agricultural Development Institute (GADI), Prof. Wayne Twine of WITS Rural Facility, Dr. Tony Swemmer of the South African Environmental Observation Network (SAEON) as well as through a registered South African National Parks (SANParks) project called CO-LD-EMS ("Remote Sensing and Ground Truthing of Land Surface Dynamics in Pristine Environments", ref. no. BAAJ1519).



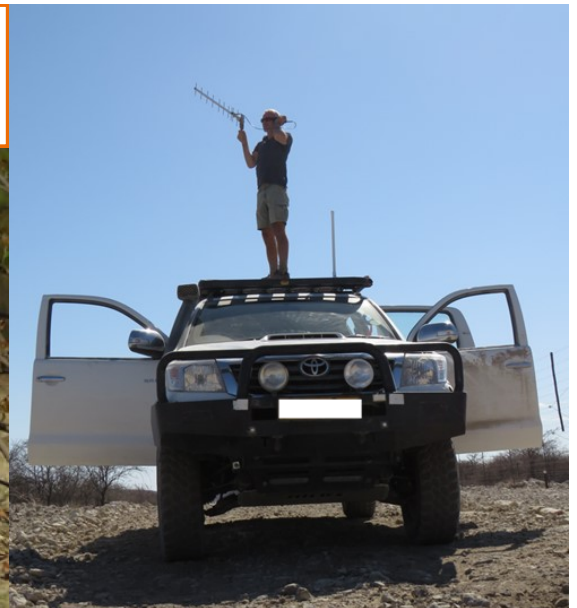


## Fieldtrips (3/6)



Fig. 1 (right): ORYCS PhD student Robert Hering locating collared animals using a VHF antenna

Fig. 2 (left): Collared springbok antelope



## First field campaign to identify the feedback between wildlife movements and vegetation structure

Robert Hering<sup>1</sup>, Mark Jago<sup>2</sup>, Niels Blaum<sup>1</sup>, Morgan Hauptfleisch<sup>3</sup>

<sup>1</sup>University of Potsdam, Germany; <sup>2</sup>University of Namibia, Windhoek, Namibia; <sup>3</sup>Namibia University of Science and Technology, Windhoek, Namibia

Namibian wildlife bears a high potential to become the substantial agricultural backbone to cope the challenges of climate change. For this to be successful the understanding of the feedback between large herbivore movements and the vegetation on a landscape scale needs to be improved. One of ORYCS work packages tackles this task by using a broad combination of GPS-tracking techniques (Fig. 1) high resolution aerial imagery and ground-truthing field observations to answer the questions: How do vegetation formations relate to animal space use? How do these relationships differ between different large herbivores and how do they change over time?

From July to November 2019, ORYCS researchers from the Namibian University of Science and Technology and the University of Potsdam captured nine individuals of one of the most important but understudied Namibian antelope species – the springbok (Fig. 2). Each springbok ewe is now equipped with a high resolution GPS collar recording GPS locations every 15 minutes and measuring 3D acceleration every 5 minutes. These collars will deliver data on the animals space use for the next two years. As each ewe is a member of a different herd, the 210 000 GPS fixes represent the space use of more than 100 springboks in an area of over 400km<sup>2</sup> already at this stage.

Within the action radius of the focal species, the ORYCS team started the recording of high resolution aerial imagery to get information on landscape wide vegetation composition and structure. This data will be the basis for 3D models of the vegetation, which in turn will verify satellite imagery. In this way long and short term data sets of vegetation dynamics will be generated and related to the movement of the animals.



## Fieldtrips (4/6)



Fig. 1 (left): Mopane (*Colophospermum mopane*) trees with installed sap-flow sensors

Fig. 2 (right): Close up on newly installed sap-flow sensor on a mopane tree

## Our journey through experimentation and observation on the water use of *Colophospermum mopane* has recently started

Katja Geißler<sup>1</sup>, Jonas Roth<sup>1</sup>, Robert Hering<sup>1</sup>, Luca Voß<sup>1</sup>, Martin Schönhoff<sup>1</sup>, Niels Blaum<sup>1</sup>, Morgan Hauptfleisch<sup>2</sup>

<sup>1</sup>University of Potsdam, Germany; <sup>2</sup>Namibia University of Science and Technology, Windhoek, Namibia

ORYCS researchers from the University of Potsdam and the Namibia University of Science and Technology have recently been setting up a short term and long term monitoring of plant related water fluxes in a large enclosure at Etosha Heights private reserve. They installed twenty-four sap flow sensors to measure tree water use (Figs. 1, 2). The work comprised of drilling holes, carving soil, threading cables into pipes, connecting cables with data loggers and constructing solar systems. Etosha Heights staff assisted us with building up 150m electric elephant fence in two days - a wonderful example of Etosha Heights' support and hospitality towards our scientists in the field!

Experimental treatments of different browsing intensity will be applied to half of the trees in the beginning of December 2019. From this experimental study, we will determine the level of water use efficiency of *Colophospermum mopane* under wildlife browsing. In addition, we get first basic data for an upscaling of atmospheric water fluxes for this savanna region.

A better understanding of water transport and water use of woody bush encroacher species is key to quantifying impacts of land use on natural resources and in particular on elements of the water cycle.



## Fieldtrips (5/6)

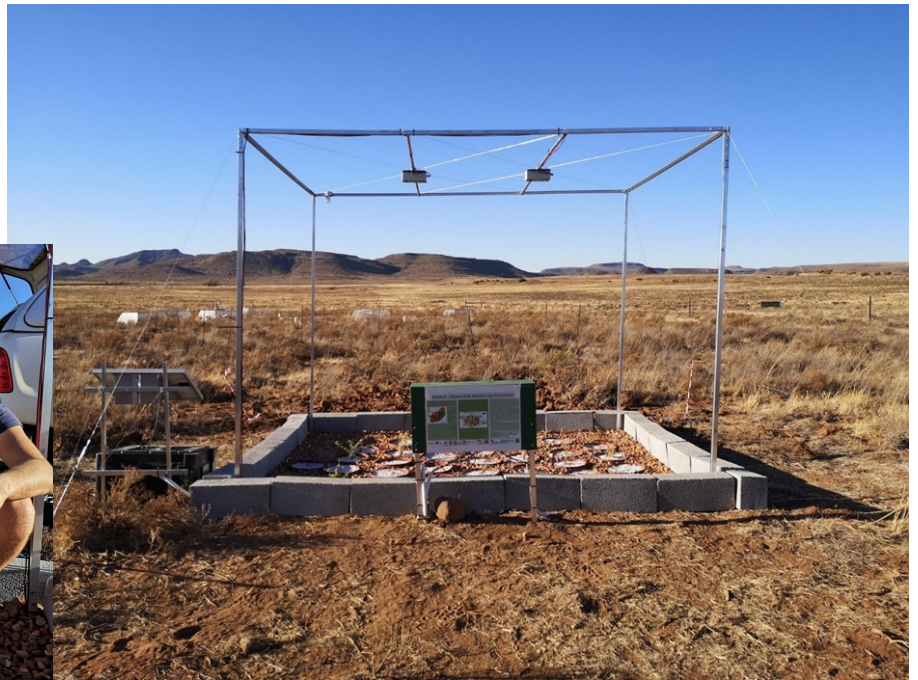


Fig. 1: Low-cost Arduino system that collects environmental data and sends it to the open-access cloud

Fig. 2: Field-ready BISMOP in the Nama Karoo near Middelburg (photos: Henning Nottebrock)

## BISMOP (Biome Shift Monitoring Phytometer) Research Trip Diary

*Henning Nottebrock, University of Bayreuth, Germany*

It was late in the evening and dark outside the window. I switched on the monitor that was following the route of our airplane – from Germany to Cape Town, South Africa, with my colleague Fabian. The images on the screen showed different shapes and colors distinguishing geographic zones of the great continent of Africa. I realized how important this research trip would be. To imagine that all these beautiful places with astonishing plant diversity may shift due to climate change. We as humans are responsible for climate change but do not know exactly how our planet earth will be changing. Thus, we need to answer an important question: How does vegetation and its magnificent diversity shift due to the impact of climate change?

Satellites may be key to it – they monitor vegetation and the environmental conditions shaping plant communities with various species and functional types such as trees, shrubs, herbs or grasses. This information can be used to classify biomes, which are vegetation units used in both environmental planning and in comparative ecosystem science.

BISMOPs are miniature common garden trials designed to provide valuable information for evaluating models and satellite monitoring systems. Each BISMOP (see next page) records the seasonal physiological activity of different types of plants. By combining information from the network of BISMOPs, we can create a fingerprint that describes how different plant growth forms relate to climate and climate change. Eleven different vascular plant species, each of which is characteristic of its biome, will be planted in each BISMOP during our research trip. The physiological activity of the plants is being monitored with special, low cost NDVI (normalized difference vegetation index) cameras that are sensitive to the photosynthetic activity of the plants. In addition, the BISMOPs are recording air temperature, pressure, humidity, soil moisture and temperature. In a nutshell, we are creating a distributed monitoring network countrywide in South Africa that allow us to monitor how different plant growth forms respond to climate change across climatic regions of South Africa.



## Fieldtrips (6/6)



### BISMOP (Biome Shift Monitoring Phytometer)

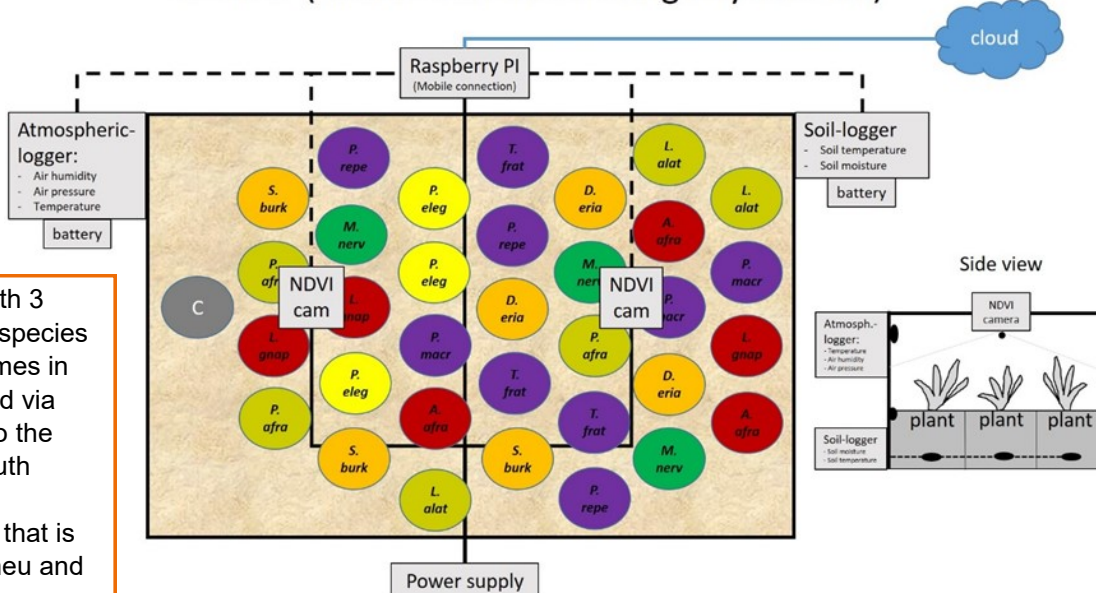


Fig. 3: BISMOP design with 3 individuals of 11 different species representing different biomes in color. All data is connected via LTE sticks sending data to the cloud at BayCEER Bayreuth Center of Ecology and Environmental Research) that is managed by Stefan Holzheu and Oliver Archner.



Biomes can be classified as the spatial composition of functional plant types as growth forms. For example, the typical composition of trees such as acacias with shrubs and grasses growing underneath and a few other growth forms shape the Savanna biome. As climate changes, biomes may shift in space and change in character – creating ecosystems that differ in distribution, appearance, dynamics and function. To better understand biome shifts, scientists use plant information from Earth observation satellites to monitor change. Other scientists are using complex simulation models called Dynamic Global Vegetation Models (or DGVMs) to predict biome shifts. Testing the predictions of DGVMs and evaluating the ability of Earth observation satellites to monitor biome shifts requires on-the-ground field measurements of plant species. This is our purpose – installing a common garden experiment, that we call BISMOP (Biome Shift Monitoring Phytometer), to get the required information of different plant types that are facing climate change.

#### Field work in action

Our research trip started at the Good Hope Nursery near Cape Town where we got plant individuals of 11 plant species that are characteristic of its biome and endemic to Southern Africa. For example, *Protea repens* is an evergreen shrub from the Western Cape Region that can be used for demonstrating the distribution of the Fynbos biome. Transplanting *P. repens* in different biomes within the BISMOP design may give us information how the plant will respond to 'new' environmental conditions in different climatic zones. After we loaded plants, material and tools in our boot, we started our research trip 6500 km through different biomes and climatic zones to set up six BISMOPs.

Travelling through South Africa to install BISMOPs in different climatic zones was a wonderful experience. Our BISMOP network has been established to send long-term observations of physiological plant information that is indispensable to understand biome shift through climate change. BISMOPs have been set up by the University of Bayreuth team of EMSAfrica in collaboration with Jasper Slingsby from SAEON. The existing experiments are hosted by SANBI-Kirstenbosch, SANParks-Skukuza, Rhodes University-Grahamstown, Grootbos Private Nature Reserve, Grootfontein Agricultural Development Institute, Middelburg, The University of the Free State at QwaQwa campus. We thank Justin du Toit and many others for invaluable support during the field trip.

Stay tuned for more updates from us!





## Stakeholder involvement



Fig. 1: Participants of the initial stakeholder workshop in Outjo, Namibia in April 2019 (photo: ORYCS 2019)



Fig. 2: Game-proof (background) and cattle-proof fence (foreground) as measures to control wildlife movements and to mitigate Human-Wildlife-Conflicts (photo: Luetkemeier 2019)

## First assessment of perspectives on wildlife management

Robert Luetkemeier<sup>1,2</sup>, Ronja Kraus<sup>1,3</sup>, Meed Mbidzo<sup>4</sup>, Stefan Liehr<sup>1,2</sup>

<sup>1</sup>ISOE – Institute for Social-Ecological Research, Frankfurt/Main, Germany; <sup>2</sup>Senckenberg Climate and Biodiversity Research Centre (SBiK-F), Frankfurt/Main, Germany; <sup>3</sup>University of Vienna, Vienna, Austria;

<sup>4</sup>Namibia University of Science and Technology (NUST), Windhoek, Namibia

One of the core research interests of the ORYCS project is the question of how wildlife-based management strategies may provide benefits for both ecosystems and society. This is a challenging task due to a variety of livelihood strategies in the study area and multiple stakeholders with diverging motives and perspectives on the role of wildlife. Cattle farming, hunting, tourism and conservation – activities that frequently cause conflicts between the involved parties, as fragmented individual measures such as fencing, limit the opportunities to find sustainable and coherent land use pathways for the entire region. In order to investigate this complex problem constellation, the ORYCS project follows an inter- and transdisciplinary research approach: scientists from the fields of wildlife ecology, vegetation dynamics, remote sensing and social ecology cooperate with actors at local, regional and national levels.

As an initial step, the project team convened a stakeholder workshop in April 2019 in Outjo, Namibia (Fig. 1). Representatives from the ministerial level, public authorities and non-governmental organizations attended the meeting as well as communal and commercial farmers. The workshop revealed interesting and partly contradicting perspectives on the role of wildlife for livelihoods and the ecosystem.

On the basis of this initial stakeholder involvement, a first qualitative empirical survey was conducted in June 2019. Interviews were conducted with representatives from governmental bodies, authorities and non-governmental institutions from agriculture, conservation and tourism. The preliminary insights confirm initial hypotheses of contradicting viewpoints on the role of wildlife. While beneficial aspects of wildlife utilization are recognized (e.g. income generation from tourism, drought adapted feeding habits), negative consequences of wildlife populations were highlighted by multiple actors. The latter revolves around human-wildlife conflicts, particularly with regard to elephants and predators such as lions.

As the conflict between farmers and elephants proved to be of high importance, especially under the current and prevailing drought conditions, two tandem-master students from Namibia and Germany conducted semi-structured interviews between May and July 2019 with commercial farmers and further stakeholders. These interviews captured the local knowledge of actors concerning the impacts of elephants on local livelihoods and farmers' response measures (e.g. fences, Fig. 2). The data is currently being analysed and paired with quantitative spatial analyses of elephant movement patterns. The aim is to receive a well-founded understanding of potential farmer-elephant conflict hot spots and to design mitigating measures upon these insights.





## Conferences & meetings of interest

### All-Atlantic Ocean Research Forum

The All-Atlantic Ocean Research Forum is held **February 6-7 2020** in Brussels, an important event to present and discuss ideas for future cooperation and research in the tropical and South Atlantic as well as the North Atlantic.

### Savanna Science Network Meeting

The Savanna Science Network Meeting ([www.savannascience.com](http://www.savannascience.com)) will take place at Skukuza, Kruger National Park, South Africa, during **March 01-05 2020**. This meeting brings together the research community looking at conservation areas within the savanna biome.

### EGU General Assembly

The EGU (European Geosciences Union) General Assembly ([www.egu2020.eu](http://www.egu2020.eu)) takes place **May 03-08 2020**, covering Earth, planetary and space sciences. Abstract deadline is 15 January and travel support grants are usually available for young researchers.

## SPACES II Midterm meeting organisations are underway – your ideas & contributions are invited!

The SPACES II projects and key stakeholders are invited to meet in the week of 18-21 May 2020 at the [Future Africa Campus](#) of the University of Pretoria, hosted by Barend Erasmus, SPACES II collaborator and Dean of the University of Pretoria's Faculty of Natural and Agricultural Sciences (NAS).

At the MTM, we will host a session of two-day workshops for students and early-career researchers. During these training sessions, jointly organized with ACCESS (Applied Centre for Climate & Earth Systems Science), the SPACES II researchers will lead training on key research themes and also on transferrable skills, such as communicating with media.

The content of the core two-day meeting consists of research updates from each of the nine projects, a poster session, panel discussions and topical sessions on themes of cross-project interest. The programme is a result of an open, joint planning process and contributions as well as offers to host workshops or sessions are warmly welcome. Please contact Mari ([mari.bieri@thuenen.de](mailto:mari.bieri@thuenen.de)) if you want to see the current meeting plan, contribute your own ideas or establish a new topical session/workshop.

At this stage, we are asking each SPACES II project leader to identify two German and two southern African participants (per project) who will be funded by the shared budget. We encourage participation of early-career researchers by inviting in-depth talks on selected topics as part of the plenary programme.

We will open registrations for the funded participants electronically in January 2020 – all registrations should be completed by end of February 2020. The coordination team at the Thünen Institute asks that paid participants do not make any reservations of flights and accommodation themselves – please be in contact if you have requests or questions for us ([ak-spaces@thuenen.de](mailto:ak-spaces@thuenen.de)).

Additional (non-funded) participants are also warmly welcome to this open event – more information on registrations will follow soon.



## Capacity Building and Training (1/5)

## SPACES II courses/training portal launched

We recently opened a web portal [www.spaces-training.org](http://www.spaces-training.org) to host all information of the SPACES II training courses and events. The terrestrial courses programme is coordinated at the Thünen Institute of Climate-Smart Agriculture (contact [mari.bieri@thuenen.de](mailto:mari.bieri@thuenen.de) / [ak-spaces@thuenen.de](mailto:ak-spaces@thuenen.de)).

The portal gives course applicants and stakeholders access to course information and electronic registration, with a recently added section for FAQ, and links to further information regarding SPACES II projects. Nearly 30 short courses, summer schools, and workshops will be implemented during the two-and-half year programme.

The course topics cover key SPACES II themes, ranging from different land-use modelling and field survey approaches to remote sensing, greenhouse gas measurements, agroforestry, and ecosystem assessment. Most courses are organized as intensive week-long “summer schools”, with a strong hands-on component, often conducted on SPACES field sites, taking advantage of on-site resources such as instruments and personnel. Most courses establish a problem-based approach, inviting the students to familiarize themselves in the various aspects of a research project, from setting research questions to design to data collection, analysis, and interpretation of results.

All SPACES II courses are realized as a joint, collaborative effort between the German and southern African partners, and many of them implement a “training of trainers” concept, engaging young southern African researchers as co-instructors. We will monitor quality of all courses by collecting feedback from students. Standardized course certificates will be available for participants.

We invite applications from southern African (i.e. SPACES focus countries) early-career researchers, students, and sometimes also technicians and/or professionals. A limited number of funded slots will be available on each course.

To spread the word, we ask all southern African collaborators to *please distribute our course adverts and the link to the web portal at your respective institutes!*

**SPACES II**  
Science Partnerships for the Adaptation to Complex Earth System Processes in Southern Africa

SPACES II is a systemic research programme, funded by the **BMBF** (German Federal Ministry of Education and Research). It is a collaborative effort between Germany and several southern African countries. Its focus is on the complex interactions between land and sea, and between the atmosphere and biosphere, in southern Africa. The five terrestrial SPACES II projects focus on the impacts of climate change and land management, while the four marine projects look at the sustainable use of marine and coastal resources under the impacts of climate change. All nine SPACES II projects aim to produce science-based policy recommendations for Earth system management, sustainable use, and preservation of ecosystem services in the region.

Read more about the [projects](#) and [partners](#) of the SPACES II research network.

[READ MORE...](#)

- Field methods for plant ecology
- Physical-based Modelling of Land Degradation Processes
- Experimental Design and Data Analyses (with R)
- Eddy Covariance Flux Measurements Winter School
- Agroforestry in Temperate and Dryland Ecosystems
- Short Course on Agent-Based Modeling & Simulation
- Introduction to Ecological Modelling (in NetLogo)
- Rapid Ecosystem Function Assessment (REFA) in Savanna Ecosystem in Limpopo
- Summer School on Synthetic Aperture Radar (SAR) Remote Sensing





## Capacity Building and Training (2/5)

## SPACES II courses open(ing) for registration

Several courses will be running in the SPACES II Training Programme during the spring 2020, and a few are currently open for applications from southern African (SPACES focus country) students/early career researchers:

**Experimental Design and Data Analyses (With R)**

Dates: 09-13.03.2020 (arrival on 08.03.2020)

Location: ORYCS field site (exact location TBA), transport organized from and to a central meeting point in Windhoek, Namibia

Registration deadline: **15.01.2020**

This course is organized by the ORYCS (Options for Sustainable Land Use Adaptations in Savanna Systems) project. Participants will learn experimental design and techniques of data collection via field case studies, focusing on groundwater, shrub encroachment and biodiversity, and statistical analysis and graphical presentation of results by using R.

**Physical-based Modelling of Land Degradation Processes**

Dates: 30.03.-03.04.2020

Location: University of Pretoria, Department of Geography, Geoinformatics & Meteorology

Registration deadline: **06.01.2020** (please see course site for registration information)

This course is part of the SALDi (South African Land Degradation Monitor) project, and offers candidates the opportunity to choose between specializing in one of two modelling sub-courses: land degradation (EROSION3D) or hydrometeorological modelling (WRF-Hydro). The aim is to provide participants sufficient skills to start using the model in their research.

**Agroforestry in Temperate and Dryland Ecosystems**

Provisional dates: 29.6.-10.7.2020

Location: Freiburg, Germany

This course is part of the ASAP (Agroforestry in Southern Africa) project, offering an introduction into agroforestry systems as an innovative and flexible approach to land management. The course takes place in Germany and invites both German and southern African participants.

## Capacity Building and Training (3/5)

### SPACES II Terrestrial projects organize joint symposium at ISEM 2019 in Salzburg



Photo: Simon Scheiter presenting at ISEM, by Reimund Rötter.

*Reimund Rötter, Simon Scheiter, Barend Erasmus*

SPACES II terrestrial projects organized a joint symposium “Modelling the Multi-functionality of Landscapes” as part of the [International Society for Ecological Modelling Global Conference](#) (3<sup>rd</sup> October 2019).

Southern African landscapes, composed of rangelands, arable lands and tree orchards, provide a range of important ecosystem functions. These functions are increasingly threatened by land use changes through multiple claims on land by agriculture, tourism, mining and other sectors, and by environmental change, namely climate change and soil degradation. Based on comprehensive data sets originating from previous groundwork by several collaborative projects on the functioning of these ecosystems, a number of biophysical and bio-economic models and modelling frameworks have been developed, evaluated and refined. Vegetation models (such as aDGVM), crop models (such as APSIM) and integrative farm models (e.g. agent-based) are useful to ex ante evaluate or explore the impact of different management or environmental change scenarios or management x environment interactions on various ecosystem functions. Of special interest are functions at landscape-level in rangelands, arable lands and tree orchards, specifically provisioning of food, feed and fuel, soil and water conservation and recycling and restoring of carbon and nutrients in soil.

The chair of the symposium was Reimund Rötter, while Simon Scheiter and Barend Erasmus acted as co-chairs. In this symposium, case studies from various modelling groups, most of them collaborating under the umbrella of the SPACES II programme (SALLnet, EMSAfrica), dealing with these issues for the different land use types in Southern Africa were presented – as well as various land use type interactions. Presenters included Munir Hoffmann (Coupling crop and vegetation modelling to quantify impact of cattle and crop management on ecosystem services in southern African landscapes); Yolandi Ernst (Modelling land use as a driver of phenology shifts in the Lowveld Region of South Africa); Simon Scheiter (Climate Change and land use impacts on vegetation – using dynamic vegetation models to understand multi-functionality in savanna rangelands); and Jan-Henning Feil (Agent-based modelling for integrated land use systems analysis in





## Training and capacity building (4/5)

## Thünen-SAEON-SASSCAL collaborative course on greenhouse gas measurement techniques



Photos: Mari Bieri,  
Thünen-AK



The first EMSAfrica Winter School in Eddy Covariance Flux Measurements 10.-14.6.2019 brought together 20 motivated young researchers and technicians from six southern African countries to the Vuwani Science Resource Centre of the University of Venda. The course was led by Christian Brümmer of the Thünen Institute and Gregor Feig of SAEON/EFTEON, and co-funded by SASSCAL via the EU project [SEACRIFOG](#).

The training took place at one of the six main research sites of the EMSAfrica project, where an eddy covariance flux tower has been set up to measure land-atmosphere carbon exchange at a peri-urban setting. The aim of the course was to support young researchers and technicians in better understanding greenhouse gas measurement techniques, especially eddy covariance, and improving the use of existing data as well as the linkages of young researchers to the research community.

In addition to providing a broader context regarding greenhouse gas measurements in Africa, the course had a strong “hands-on” focus; this unique approach was made possible by support from our SAEON and CSIR partners. Our participants learnt to understand an eddy covariance system from theory to setting up instruments, and further to data processing and analysis. Several visiting researchers provided us with insights to their ongoing research projects and programmes in South Africa.

To build sustainability of the training, the team of tutors was strengthened by young researchers from partnering institutes CSIR and SAEON, and as a special highlight, we welcomed several contributions from the EU project SEACRIFOG. The EMSAfrica project engineers also joined the course as trainers.

Special thanks to our hosts at the Vuwani centre/University of Venda for providing support for the event, and helping us promote the topic of climate change and greenhouse gas measurements also within the local community and in the local media.

We are happy to announce that this course will be repeated in late (northern hemisphere) summer or autumn 2020, and again in 2021 via the SPACES II integrated training programme. For more information, follow the link to [EMSAfrica website](#) or contact coordinator: [mari.bieri@thuenen.de](mailto:mari.bieri@thuenen.de)



## Training and capacity building (5/5)

## EMSAfrica organizes training on Synthetic Aperture Radar (SAR) Remote Sensing for Environmental Monitoring



Photos: Christian Berger, FSU Jena

The first Summer School focusing on SAR Remote Sensing was organized by the EMSAfrica project's remote sensing team with support from SALDi. A total of 13 young researchers from different southern African countries were chosen to attend the course, which took place at the WITS Rural Facility during the 23-26 September 2019.

The leaders of the intensive four-day workshop were Christiane Schmullius (FSU Jena) and Iain Woodhouse (University of Edinburgh), who kindly contributed to our programme as an external expert. Course tutorials were run by Clemence Dubois, Marcel Urban and Christian Berger from FSU Jena.

The content of this course was a mixture of theory lessons, corresponding practical tutorials related to Sentinel-1 time series data (backscatter intensities), and their analysis with open source software. We wanted to open the course to all interested participants, and no background knowledge on SAR remote sensing was expected. Instead, all participants were asked to complete an online course "Echoes in Space" from the EO College.

SAR remote sensing has various important applications in savanna research, and the interest to the method was very high concluding from the number of applications. Based on participant feedback and the lively discussions during and after the course, we were encouraged to plan a repeat course for 2021.

For more information, see [EMSAfrica website](https://www.emsafrica.org/) or contact course coordinator: [christian.berger@uni-jena.de](mailto:christian.berger@uni-jena.de)



## Scholarships, grants, awards, open positions

### DAAD scholarships and closing dates

#### for Southern Africans to Germany

- type B / binationally supervised doctorates
  - \* with German language course Aug.-Sep. 2020: 15 Apr. 2020
  - \* without language course: 2.5 months in advance
- type C-F / short-term research stays: 2.5 months in advance

#### for Germans to Southern Africa

- type G-I / short-term research stays: 2.5 months in advance

Proposals for summer schools in 2020 should be submitted 3 months in advance and until 30 Aug. 2020 (marine projects).

### ASAP mobility grants

Mobility grants for short-term scientific exchange will be available in 2020 from the ASAP project. Please visit [www.agroforestry-africa.org](http://www.agroforestry-africa.org) for details on eligibility and how to apply. The ASAP mobility grants aim to foster collaboration and capacity building between Europe and southern Africa within the thematic of agroforestry.



### Humboldt research award for Guy Midgley

SPACES II partner, Professor Guy Midgley from Stellenbosch University has been awarded the prestigious Humboldt Research Award by the Alexander von Humboldt Foundation. The award will support Guy's research visits to Germany, hosted mainly by Prof Steven Higgins (EMSAfrica) from the University of Bayreuth.

### Open PhD positions

Funded PhD positions are open in two SPACES projects:

ORYCS project:

[https://www.orycs.org/downloads/ORYCS\\_waterfluxes.pdf](https://www.orycs.org/downloads/ORYCS_waterfluxes.pdf)

EMSAfrica project:

<https://www.emsafrica.org/join-us/fully-funded-phd-position/>

