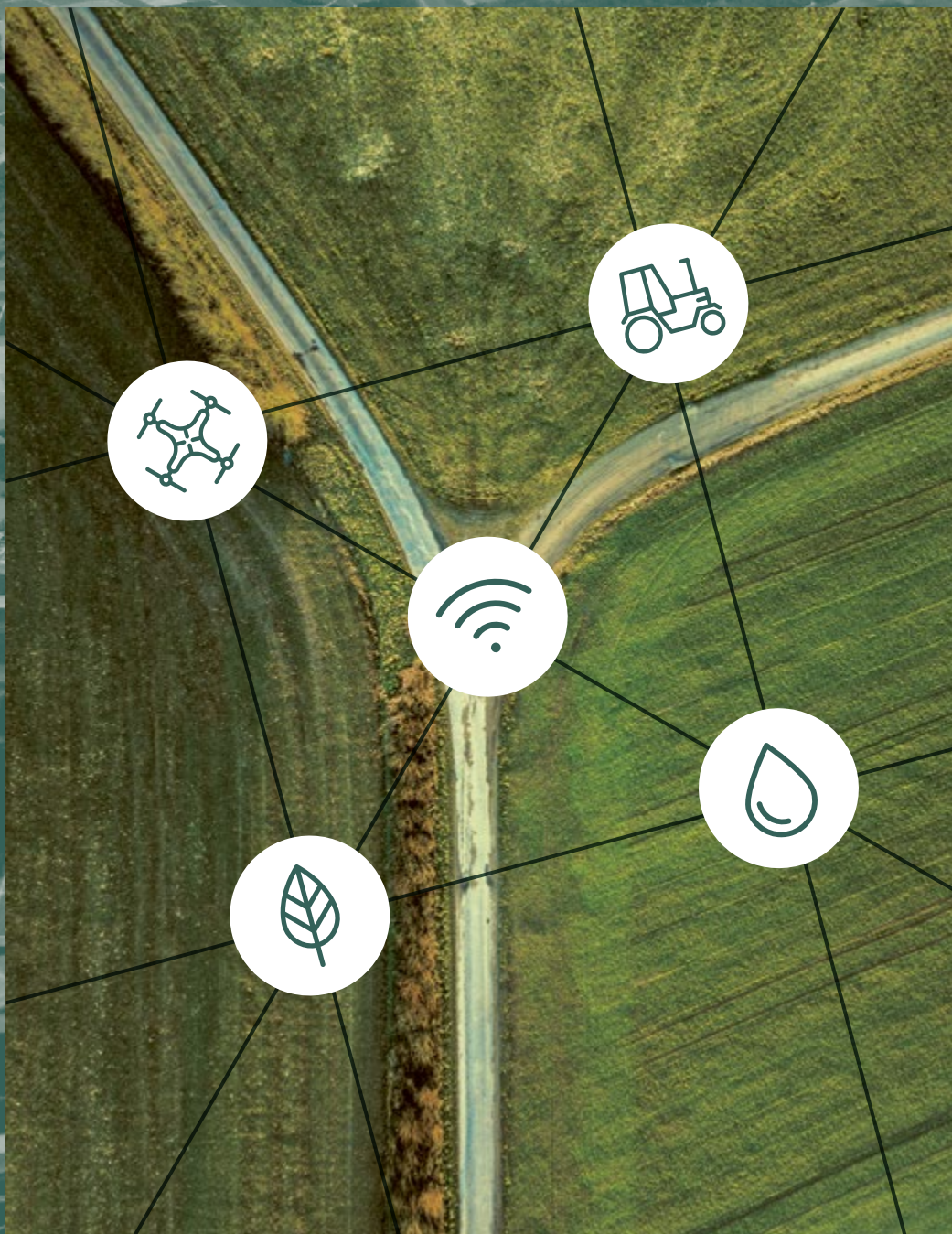# zalf

ANNUAL REPORT 2017

LEIBNIZ CENTRE FOR
AGRICULTURAL LANDSCAPE RESEARCH
(ZALF)

zalf

ANNUAL REPORT 2017

LEIBNIZ CENTRE FOR
AGRICULTURAL LANDSCAPE RESEARCH
(ZALF)

CONTENT

PREFACE

In 2017 we celebrated our 25th anniversary and took the opportunity to look back on a quarter-century of agricultural landscape research at ZALF. Despite many societal developments and changes, we believe that our research direction adopted in 1992, when ZALF was founded, is as relevant and important as it was 25 years ago. As stated in the founding document, »ZALF develops sustainable land use systems in agricultural landscapes that meet the diverse interests of society«. Over the years, these interests have become even more diverse and sustainable land use systems must meet the huge challenges agriculture is facing: the sustainable use of natural resources, the minimization of environmental risks, adaptation to climate change and climate protection and the preservation of biodiversity while simultaneously ensuring food security. The complexity of these challenges requires integrated solutions at the landscape level. This is where ZALF comes in with its research, development and implementation support.

Prof. Dr. Frank A. Ewert has been the Scientific Director of ZALF since 1st March 2016.

Like other sectors, agricultural production is subject to the opportunities and risks of an increasingly globalized world. Our research is therefore inevitably international and closely aligned with the sustainable development goals adopted by the United Nations in 2015. We maintain and enlarge a wide cooperation network with partners in Germany, Europe and the world and integrate knowledge and stakeholders from all relevant parts of society. ZALF plays a leading role in agricultural landscape research and we expand our engagement in national and international research activities and projects.

This annual report provides a view on some of our ongoing research activities. For example, our climate change related research includes both, studies related to climate protection, particularly on the role of soil erosion for achieving the 4per1000 target, but also on adaptation strategies of agriculture to climate change. In order to transfer knowledge about soil and plant-specific processes to the landscape level, we are investigating and developing new approaches for quantifying and modelling spatial and temporal variabilities in agricultural landscapes. We are also studying how agriculture can continue to maintain or improve the provisioning of public goods in the future. In this context, tools for innovations for sustainable land management play an important role, as do collaborations and networks between public and private institutions.

In a series of new projects, we are investigating new crop species for Germany, such as soybean, environmental risks due to antibiotic resistance, questions of landscape genetics in forest ground vegetation, the quantification of soil structure properties and the sustainable use of grasslands on drained peatland soils. In addition to many national and European studies, we also address important research questions in other regions of the world, such as land use change in different biomes in South America.

I cordially invite you to learn more about these and other topics on the following pages.

PROF. DR. FRANK A. EWERT
Scientific Director

CORE TOPICS

SOLUTIONS FOR THE SUSTAINABLE USE OF AGRICULTURAL LANDSCAPES — CORE TOPICS

ZALF FEATURES A UNIQUE COMBINATION OF EXPERTISE IN NATURAL, ENGINEERING, AND SOCIAL SCIENCES. FOCUSING ON THREE CORE TOPICS, RESEARCH QUESTIONS OF HIGH RELEVANCE TO SOCIETY CAN THUS BE STUDIED AT DIFFERENT SCALES.

Considering societal problems as a starting point for identifying research questions, ZALF derives its research topics mainly from the 2030 Agenda for Sustainable Development of the United Nations (UN) as well as the Grand Societal Challenges formulated by the Wissenschaftsrat (German Council of Science and Humanities), and in consideration of societal developments and relevant discussions in science policy.

Agricultural landscape research at ZALF focuses on the sustainable agricultural intensification as a contribution to food security and to the production of biomass for material and energetic use. Associated with these production-oriented aspects are research activities aiming for sustainable resource and water management, the improvement of ecosystem services as well as the maintenance and promotion of biodiversity in agriculturally used landscapes. The impacts of climate change on agricultural landscapes and the development of adequate adaption measures are our overarching research topics. The development of ecologically, economically, and socially sustainable land use concepts requires the consideration of the complex natural scientific mechanisms as well as relevant stakeholders and the socio-economic and institutional context.

ZALF's main task is therefore to combine natural, engineering, and social research in transdisciplinary approaches in order to develop solutions and recommendations for the sustainable use and development of agricultural landscapes. Research at ZALF is organised in three core topics, which focus on different characteristics and interdependencies of the overall system: natural sciences (Core Topic I), land use-related aspects (Core Topic II), and socio-economic research (Core Topic III).

CORE TOPIC I
»LANDSCAPE FUNCTIONING«

CORE TOPIC II
»LAND USE AND IMPACTS«

CORE TOPIC III
»LAND USE CONFLICTS AND GOVERNANCE«

CORE TOPIC I »LANDSCAPE FUNCTIONING«

Core Topic I focusses on studying the natural science basis of the »functioning« of spatio-temporally differentiated landscape processes, aiming to improve the understanding of all relevant processes as well as their interdependencies and interactions within the landscape.

Core Topic I constantly derives new problem-oriented data and knowledge from basic research, which are then transferred to Core Topics II and III. This includes, for example, statements on the environmental impact of land use systems as well as recommendations regarding the optimisation of water and nutrient utilisation and the reduction of land use-related environmental impacts.

PROJECTS OF CORE TOPIC I (SELECTED)

- CarboZALF — Carbon dynamics of arable landscapes under climate change, BMEL, MWFK (p. 20)

- I4S — Intelligence for Soil: Integrated system for site-specific soil fertility management, BMBF (p. 21)

- StaPlaRes — Nitrogen stabilization and subsurface placement as innovative technologies enhancing the resource efficiency of fertilized urea, BMEL

- pETchy — Patterns of evapotranspiration changing throughout the year, DFG

- SOARiAL — Spread of antibiotic resistance in an agrarian landscape, Leibniz-Gemeinschaft (SAW) (p. 12)

- SOMATRA — Solute mass transfer through the macropore-matrix interface during preferential flow in structured soils: model development, DFG

- Small Scale II — Quantification of small-scale physicochemical and microbiological properties of intact macropore surfaces in structured soils, DFG (p. 13)

CORE TOPIC II »LAND USE AND IMPACTS«

Core Topic II deals with agricultural production in a landscape context, with explicit consideration and utilisation of the diverse feedback mechanisms operating on various spatial and temporal scales in agricultural landscapes.

Based on the natural science basis (Core Topic I), management measures and their role as controlling factors in the interaction of land use and ecosystems are the objects of investigation in Core Topic II. Climate change, trends in prices, changes in demand, and the governance of agricultural landscape use as well as technical developments and other socio-economic trends are considered as exogenous driving forces. Agricultural and forest land use is shaped by these drivers and at the same time interacts with ecosystems and the entire landscape. Indicator systems are developed for impact assessment and the evaluation of land use changes. These indicator systems aggregate individual analytical results into knowledge relevant for action and decision-making.

PROJECTS OF CORE TOPIC II (SELECTED)

- Climate-CAFÉ — Climate change adaptability of cropping and farming systems for Europe, Workpackage B: Economic evaluation of climate adaptation strategies, EU FACCE-JPI / ERA-NET (BMBF) (p. 22)

- PROVIDE — Providing smart delivery of public goods by EU agriculture and forestry, EU Horizon 2020 (p. 23)

- MACSUR II — A detailed climate change risk assessment for European agriculture and food security, Subproject: Impact of adaption szenarios on soil and ecosystem services, EU FACCE-JPI (BMBF)

- BioMove — Subproject 10: Interactions within communities of microorganisms may affect dispersal of phytopathogenic fungi in the phyllosphere of host plants

- WAYS — CLIENT China Joint Project: Sustainable technologies and services for water and resource management at the upper Yangste River, Sichuan Province, China, Subproject A, BMBF

- INNISOY — Innovation network to improve soybean production under the global change, BMBF (p. 14)

- Meta-analysis of the benefits of organic farming for the environment and society, BMEL

- Landscape genetics of insect-pollinated forest herbs in changing agricultural landscapes, DFG (p. 15)

CORE TOPIC III »LAND USE CONFLICTS AND GOVERNANCE«

Core Topic III focuses on the preferences of various land users and stakeholders and the resulting land use conflicts at the landscape level.

Based on the analysis and evaluation of existing governance methods and instruments, scientists investigate the instruments and institutions required to achieve sustainable land use and the stakeholders which are relevant for the development and implementation of institutional solutions. The inclusion of stakeholders that are relevant for agricultural landscape use as well as their interests and logic of action are prerequisites for adapting and newly developing governance approaches at regional, national, and international levels.

PROJECTS OF CORE TOPIC III (SELECTED)

- Innovation group ginkoo — Designing integrative innovation processess: New institutional and regional forms of coordination for sustainable land management, Subproject 4, BMBF (p. 24)

- cp³ — Civil-Public-Private-Partnerships (cp³): collaborative governance approaches for policy innovation to enhance biodiversity and ecosystem services delivery in agricultural landscapes, Subproject: Coordination - Production practices and governance recommendations, BMBF / ERA-NET (p. 25)

- AgoraNatura — NaturMarkt, BMBF, BMUB

- FuFoCo — Future Food Commons: Sharing Economy in food sector - New models of consumer-producer interaction in urban food supply, trends and impacts, BMBF

- DBV-Evaluation — Living agricultural landscapes – farmers create diversity! Subproject: evaluation of the main project, BfN

- SuLu2 — Land use change in savannahs and grasslands - solutions through political commitment, land use planning and best management practices, BMUB (p. 16)

- ORDIAmur — Overcoming replant disease by an integrated approach, BMBF

- Innovation groups scientific coordination project, BMBF

- PEATWISE — Wise use of drained peatlands in a bio-based economy, BMEL / ERA-GAS (p. 17)

ZALF Project Database: http://www.zalf.de/en/forschung_lehre/projekte/

NEW PROJECTS

THE SPREAD OF ANTIBIOTIC RESISTANCE IN AN AGRARIAN LANDSCAPE

ROGER FUNK, STEFFEN MÜNCH, NATALIE PAPKE

Measurement of dust emissions during tillage directly after manure application

About half of the antibiotics used in Germany are administered in livestock farming, resulting in high rates of antibiotic resistance. The use of farmyard manure or slurry as organic fertilizers in agriculture establishes a new pathway for antibiotic-resistant bacteria to spread in the environment. It is the objective of the project SOARiAL to investigate the risk of the atmospheric, dust-associated spread of antibiotic resistances in the environment.
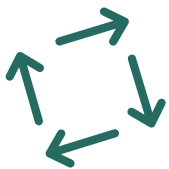
The dispersal of antibiotic resistances is a major concern for public health, particularly resistances against antibiotics that are considered as drugs of last resort in human medicine. In order to maintain their effectiveness, their usage should be limited to selected serious cases.

Due to the use of antibiotics of last resort in livestock farming, resistances are also developing in stables. The transmission of these antibiotic-resistant bacteria to humans has already been confirmed for two pathways: direct contact to animals and via the food chain. The faeces of pigs and chicken can also be contaminated with abundant antibiotic-resistant bacteria. The use of farmyard manure or slurry as organic fertilizer therefore opens up new possibilities for these resistances to spread in the environment. The project especially focusses on the atmospheric dispersal via the dust fraction, because bacteria can travel long distances and fast and easily cross ecosystem boundaries via this pathway.

The project SOARiAL, funded by the Leibniz Association, has the objective to investigate how antibiotic-resistant pathogens are spread by the wind. Emphasis is placed on identifying and quantifying the dust-associated spread from arable land depending on the pretreatment of the organic manure, soil properties and tillage operations. Based on measured data, emission and dispersal will be modelled, the risk of the dust-associated transmission will be estimated, and reduction or prevention measures will be derived. To reach these objectives, four Leibniz Institutes and the Institute for Animal Hygiene and Environmental Health of the FU Berlin cooperate in this interdisciplinary project consortium.

Within the project, ZALF is responsible for characterizing the conditions favoring dust emissions during wind erosion and tillage operations, as well as for quantifying and classifying the emitted dust regarding particle size and composition. The ZALF project team will conduct field and wind tunnel experiments with different soil types, organic fertilizers and application methods, in order to determine the dependency of dust emissions on soil type and tillage operations. Based on particle sizes and the relative share of mineral and organic compounds, conclusions on suspension and dispersal behavior can be drawn, which can be then used in modelling approaches.

QUANTIFICATION OF MACROPORE PROPERTIES IN LUVISOLS

MARTIN LEUE
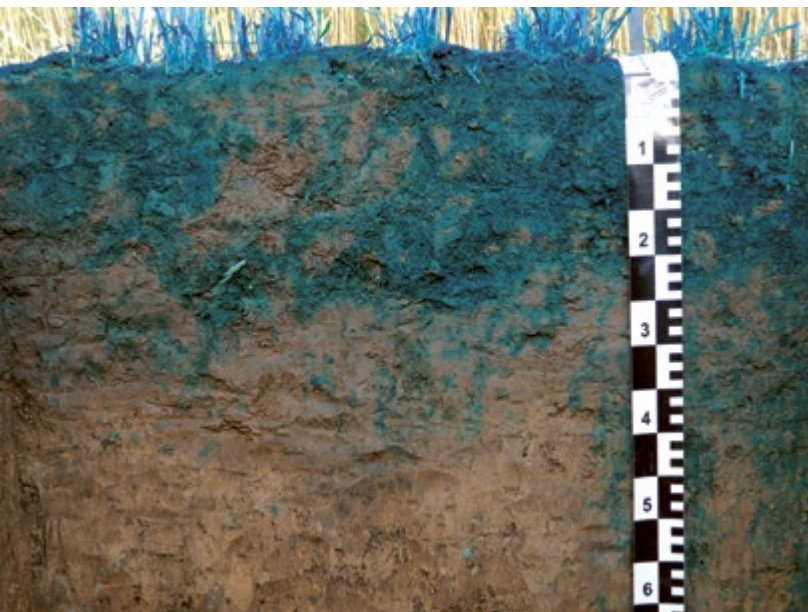
Luvisol developed on Loess: Visualization of preferential flow paths in macropores by colour tracer

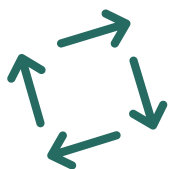**In structured soils with complex macropore networks, large amounts of water and reactive solutes can be preferentially transported during rainstorm events. This effect is relevant from the pore to the landscape scale. It is the objective of this project extension to quantify the properties of intact macropore surfaces using the example of Bt-horizons from Luvisols. The project focusses on microbiological and geometrical properties. The obtained data will contribute to a more precise modelling of mass transport and turnover in agricultural landscapes.**

In structured soils, water and reactive solutes can preferentially move through a macropore network consisting of larger inter-aggregate pores, cracks, and biopores.

The surfaces of these structures are often coated by soil organic matter (SOM) and clayey material and can be colonized by microorganisms, which promote turnover processes such as carbon release from subsoils. The physico-chemical and geometrical properties of these structural surfaces influence the preferential flow through soils as well as the water and mass exchange between the different flow domains (macropores and soil matrix). The vulnerability and structural complexity of these surfaces complicates the parametrization of their properties. To date, parameters of intact structural surfaces were only obtained concerning the potential wettability of SOM and the roughness of the structures. It is the idea of this project to extrapolate the two-dimensionally determined properties of the structural surfaces to entire soil horizons by means of three-dimensional analyses of the spatial arrangement of these macropore structures. Thus, the effects of structural surface properties on preferential flow and turnover processes in Bt-Horizons are to be estimated.

The objective of this project extension is the quantification of small-scale physico-chemical and microbial properties of intact structural surfaces from Bt-horizons of Luvisols developed on loess and glacial till. The project extension features the following work packages:

1) The entire macropore system potentially and actually (active during specific flow events) available during preferential flow will be three-dimensionally quantified using x-ray computer tomography (µCT) dye tracer experiments, respectively, in order to assess the spatial relevance of surface structures for preferential flow. The combination of µCT measurements of small- and large-sized samples will ensure the consideration of all macropore sizes.

2) The physico-chemical properties of intact structural surfaces (OC content, SOM composition, CEC, microbial activity) will be two-dimensionally quantified using infrared spectroscopy in the diffuse reflectance mode (DRIFT mapping).

3) The characterization of the spatial distribution of soil microorganisms and their abundance and activity by means of zymography and DRIFT mapping aims to identify microbial hot spots, to explain local small-scale differences in SOM composition, and to assess the relevance of structural surfaces with respect to carbon turnover in subsoils.

INNOVATION NETWORK TO IMPROVE SOYBEAN PRODUCTION UNDER GLOBAL CHANGE

SONOKO D. BELLINGRATH-KIMURA, MORITZ RECKLING, RALF BLOCH, JOHANN BACHINGER, JOHANNES HUFNAGEL, HUA MA, CLAAS NENDEL

Experts from Japan, France and Germany inspect soybean plants on a farm field in Brandenburg, Germany, during the kick-off-meeting on July 27 and 28, 2017.

Soybeans are an important source of protein for food and feed due to their high protein content and the high quality of the amino acid content. The symbiotic nitrogen fixation (SNF) of the rhizobium bacteria living in symbiosis with the soybean roots contributes 60–80 % of the total plant nitrogen uptake and is thus one of the most important factors influencing the nitrogen supply of the soybean plant. The SNF activity is the result of multiple symbiotic interactions among the soybean cultivar, the strain of rhizobium, environmental conditions and crop management. SNF is the key to a successful cultivation of soybeans.
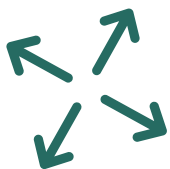
The establishment of a stable SNF in soybean is subject to globally diverse, site-specific challenges. In Japan, high levels of precipitation lead to oxygen deficiency and inhibited root growth on loamy soils. In contrast, water shortage is the biggest limitation for soybean cultivation in parts of Europe. While sulfur deficiency becomes more and more common in European soils, the volcanic soils of Japan feature high amounts of natural sulfur. Nitrogenase, the main enzyme of the SNF, is especially sensitive with respect to sulfur deficiency. Sulfur availability in soils is therefore of major importance for a sustainable soybean cultivation.

It is the objective of this international project supported by the »European Interest Group CONCERT-Japan« to create an innovative network linking soybean research in Japan, Germany, Turkey and France. The network particularly aims to clarify the impact of different environmental factors, especially water and sulfur supply, on the SNF and soybean yield, and to calibrate and test dynamic models for the prediction of soybean growth under different soil and environmental conditions. The project consists of three interlinked work packages: 1) analysis of soybean growth, 2) investigation of SNF under different environmental conditions, and 3) modelling of soybean growth based on a dynamic crop growth model.

Innovative soybean cropping methods will be developed based on the combination of results from field and pot experiments with site-specific modelling of soybean growth at various locations globally. Project results will contribute to the establishment of sustainable soybean cultivation under the challenge of global change.
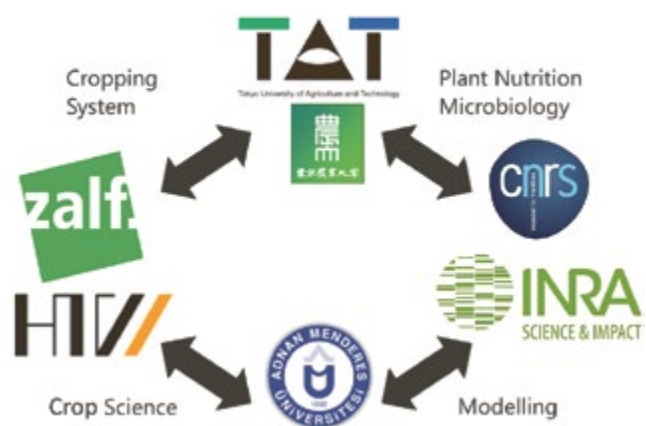
Partners of the INNISOY Research Network

LANDSCAPE GENETICS OF INSECT-POLLINATED FOREST HERBS

TOBIAS NAAF

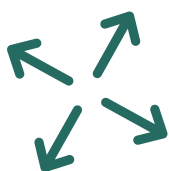Forest fragments in an agricultural landscape (Prignitz, NW Brandenburg)

Most of the biodiversity in agricultural landscapes can be found in small fragments of semi-natural habitats. However, many species are not adapted to live in small habitat islands. For instance, typical deciduous forest herbs evolved during times when the landscape was more or less continuously forested. In this project, population genetic and landscape ecological approaches will be combined to gain insights into the forest herbs' ability to build a regional population structure (e. g., a metapopulation), which is necessary for a long-term survival in habitat fragments. Here, we focus on the role of insect pollinators for the gene flow among plant populations.

The gene flow among spatially isolated plant populations occurs via seed and pollen dispersal. In case of most forest herbs it therefore depends on seed- or pollen-dispersing animals. These animals must cross the agricultural landscape between the forest fragments, likely resulting in impacts of the landscape structure on animal behaviour and thus on the gene flow among plant populations.

This project will not only investigate the regional population genetic structure of forest herbs, but also of their associated pollinator species. Therefore, the project has been developed together with the colleagues Dr. Stephanie Holzhauer (head of the ecology section) and Dr. Katja Kramp (head of the molecular laboratory) from the Senckenberg German Entomological Institute (SDEI). The project has three main objectives:

1) to elucidate the role of the herbs' mating strategy in shaping the regional population genetic structure (selfing vs. outcrossing; short vs. long forage distance of the associated pollinator species);

2) to determine the effects of the landscape matrix on the regional population genetic structure, With a particular focus on the role of selected crop species (maize, oilseed rape), corridors (e. g., hedgerows) and barriers (e. g., roads); and

3) to detect legacies of the past in present-day plant population genetic structures. Here, we expect the current population genetic structure to better reflect the landscape structure of some decades ago than the current landscape structure.

The research project will focus on three forest herb species, which will be surveyed in collaboration with colleagues from the FLEUR network (www.fleur.ugent.be) in seven different agricultural landscapes distributed throughout Northwestern Europe. In addition, the population genetic structure of two associated pollinator species, a bumblebee and a hoverfly species, will be studied in three of the selected landscapes.

Hoverfly feeding on pollen of wood anemone (Anemone nemorosa)

LAND-USE CHANGE IN SAVANNAHS AND GRASSLANDS OF SOUTH AMERICA

LUCA EUFEMIA, STEFAN SIEBER, MICHELLE BONATTI

Dry savannah in Paraguay

South American savannas and grasslands represent one of the most threatened biomes worldwide. Yet, they are habitat for numerous plants and animals adapted to their unique hydrologic regimes and soil conditions and provide important ecosystem services, such as climate regulation or water purification. However, this ecosystem service provisioning is less valued than for other ecosystems like tropical forests. While the total economic value of other biomes, such as rain forests, appears to be relatively well understood, no empirical valuation research addressing intact grasslands and wetlands can be found to date.

As a result, grasslands likely represent the least understood biome in the world in terms of their true value to sustainable economic use and the provisioning of sociocultural and ecosystem goods and services contributing to human health and well-being. Against this background, only a very small percentage of both the Colombian Orinoquia and the Paraguayan Pantanal benefit from legal or state protection, although both regions are at risk for being converted into land for intensive and unstainable use. The WWF SuLu2 project aims to implement climate-smart land-use zoning and management for savannas and grasslands in Colombia's Llanos (Orinoquia) and Paraguay's Pantanal in order to maintain carbon, biodiversity and water regimes, and to contribute to sustainable agricultural production.

Within this context, the research axis of the SuLu2 project is built upon a program in Agricultural Sciences at the Humboldt-Universität zu Berlin, focussing on the development of an analytical governance framework to implement sustainable land-use and conservation programmes: the enhancement of community approaches in South America.

The objectives of the program are to (1) identify the most adequate governance models for grasslands and savannas in Paraguay and Colombia, (2) analyse the main successful experiences across governance groups, (3) evaluate effective strategies in order to derive recommendations for policy and society, and furthermore, to (4) finally develop an analytical governance framework to implement sustainable land-use and conservation programs.

Hence, the range of community-based governance models will be identified, assessed and evaluated, and the applied methods will be enhanced within the framework of political ecology. Overall, recommendations and guiding principles to enhance conservation policies and communal strategies of grasslands and savannahs will be identified and tailored to international platforms and negotiation scenarios.

WISE USE OF DRAINED PEATLANDS IN A BIO-BASED ECONOMY

BETTINA MATZDORF, LASSE LOFT

Measuring GHG fluxes of agriculturally used fen peatlands in Brandenburg

Drained peatlands are a considerable source of greenhouse gas (GHG) emissions. Comprehensive rewetting, however, is hardly feasible under the current societal set-up. There is a need to identify climate-smart management options for peatlands and measures for their promotion. Their integration into climate policy requires an improved knowledge of GHG fluxes and methods for measuring emissions of various peatland management regimes. Incentive-based governmental policy instruments and private sector initiatives are considered particularly relevant for administrating sound peatland management. The PEATWISE project will analyze such incentive-based policies and related actors in Europe and New Zealand.

Approximately one third of the global soil carbon stocks is stored in pristine peatlands. As a result of peatland drainage, the stored carbon is relased resulting in tremendous amounts of GHG emissions. The EU member states are globally the second largest producer of such emissions. Under the prevailing societal conditions, peatland management innovations that allow for biomass production while minimizing GHG emissions are of high importance. In order to mainstream such innovations, a targeted climate policy and appropriate governance models are needed.

On the other hand, climate policy can only take up these climate-friendly land use options if suitable methods are available to measure and account for GHG emissions of different peatland use regimes. PEATWISE therefore deals with relevant peatland management options as well as with the quantification of associated GHG emissions in comparison to reference scenarios. The emission data can then be used to design incentive-based policies and private sector initiatives to foster the corresponding land use options. However, in addition to the reduction of GHG emissions, the provisioning of ecosystem services and biodiversity associated with different land use regimes is also of importance for the design of such management instruments.

Research institutions from six different countries will collaborate in the PEATWISE project to identify and assess relevant peatland use options. Furthermore, they will work on the quantification of GHG emissions of different peatland management regimes and develop climate policies and private initiatives to promote these climate-smart land use types. While including the most relevant actors, ZALF will take the lead in analyzing existing governmental incentive-based policy instruments in Europe and New Zealand and draw conclusions for the design of innovative climate policies in the context of peatlands. Results will be discussed with stakeholders in workshops in at least three EU countries.
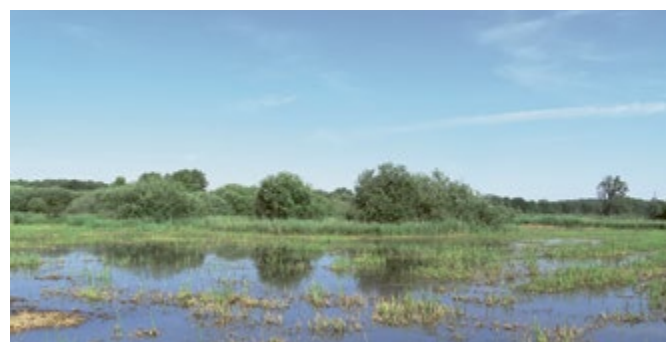
Agriculturally used and rewetted grassland on fen peat soils

Project: PEATWISE—Wise use of drained peatlands in a bio-based economy **Term:** 2017–2020 **Funding:** ERA-GAS, BMEL **Lead at ZALF:** B. Matzdorf (matzdorf@zalf.de) **Partners:** Norwegian Bioeconomy Res. Inst., Swedish Univ. of Agricultural Sciences, Aarhus Univ., Radboud Univ. Nijmegen, Univ. of Eastern Finland, Univ. of Oulu, Univ. of Waikato **ZALF contribution:** SO
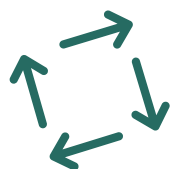
CURRENT PROJECTS

THE 4PER1000 INITIATIVE—WHAT CAN WE LEARN FROM THE EROSION-CARBON NEXUS?

MICHAEL SOMMER, JÜRGEN AUGUSTIN

The CarboZALF experimental site near Dedelow (NE Germany)

At the climate conference in Paris 2015 (COP21), an initiative was launched to reduce atmospheric CO_2 by means of an enhanced carbon sequestration into soils—the »4per1000 initiative: Soils for Food Security and Climate«. The basic idea behind this initiative is that a global increase in soil organic carbon (SOC) stocks by just 4 per mill (per year) will compensate for 80 % of the annual CO_2 increase in the atmosphere. A significant and sustainable increase of soil organic carbon, e. g. by management practices or amelioration, can only be achieved in soil systems far from equilibrium conditions, such as rewetted, formerly drained peatlands or carbon-unsaturated mineral soils

Basic principles of an enhanced carbon sequestration in carbon-(C)-unsaturated mineral soils can be tested in soils affected by soil erosion, since this process brings C-unsaturated subsoil to the surface.

At the CarboZALF-D experimental site near Dedelow (NE Germany), the magnitude, rates and mechanisms of soil C sequestration are quantified under controlled field conditions. A long-term manipulation experiment started in autumn 2010 with an artificial soil displacement in sloping terrain. Since 2010, all C fluxes needed to derive a full C balance have been measured for representative soil types. This includes a continuous CO_2 flux monitoring (net ecosystem exchange, NEE), a quantification of C exports by crop harvest as well as solute transports of organic (DOC) and inorganic carbon (DIC). Summing up all fluxes yields soil-specific full C balances corresponding to the change in SOC over time (= Δ SOC). After 6 years, the SOC stock of the artificially eroded site (Calcic Luvisol) has increased by 0.9 kg C m^{-2} in total. This effect has been described as »dynamic replacement« in scientific literature. We observed surprisingly high mean annual C sequestration rates (144 g C m^{-2} y^{-1}) - comparable to natural peatlands.

To further unravel the mechanisms of plant C transfer into the topsoil we set up a tracer study ($^{14}CO_2$ pulse labelling) for an eroded and non-eroded site, both grown with maize. The lab experiment revealed a very fast and surprisingly high transfer of plant C into the protected soil organic matter fraction (eroded ~2x non-eroded soil).

Our study proved the concept of a high, fast and sustainable C sequestration in mineral soils showing a high C saturation deficit. Of course, inducing soil erosion is not a reasonable measure to sequester CO_2-C. However, due to our new mechanistic understanding, we postulate the same effect for a controlled admixture of subsoil material into the plough (Ap) horizons. For this purpose, we will develop and test specific tillage systems to achieve a fast, considerable, and sustainable CO_2-C sequestration without a loss of soil fertility.
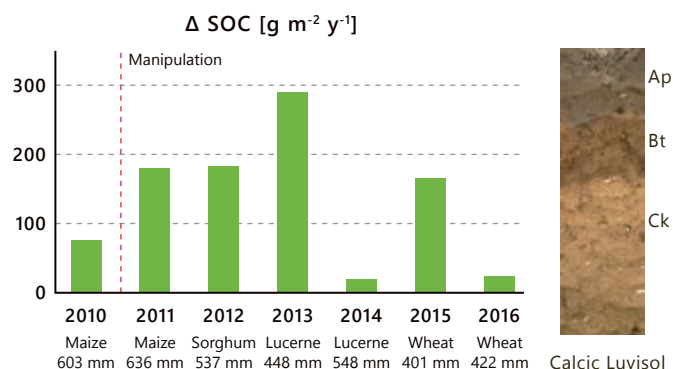
Dynamics of soil organic carbon (SOC) stocks at an eroded Luvisol from the CarboZALF experimental site

SOIL STATE VARIABLES IN SPACE AND TIME—COMBINING SENSING AND MODELING

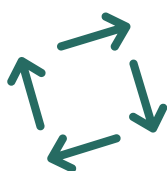EVELYN WALLOR, KURT-CHRISTIAN KERSEBAUM

Aerial view of the experimental field at Görzig, Halle, including a spatial pattern generated by proximal soil sensing (here: electrical conductivity)

The lack of affordable methods for mapping relevant soil attributes is a fundamental problem in precision agriculture. It restricts the development and application of advanced models and algorithms for decision making. The project »I4S—Integrated System for Site-Specific Soil Fertility Management« combines new sensing technologies with dynamic soil-crop models. By using sensors with different measuring principles the estimation of soil fertility variables such as plant available nutrients, water, organic matter and soil texture can be improved. Choosing the appropriate set of sensors will become an important aspect of decision making in precision agriculture.

The high small-scale spatial variability of soil properties requires an adjusted site-specific agricultural management to avoid wasting resources, environmental pollution and decreasing soil fertility.

With proximal soil sensing, we are able to generate highly resolved soil information (e. g. soil texture, soil organic carbon) at field scale and to depict their within-field variability. The combination of sensor information with dynamic soil-crop models facilitates the derivation of spatial information relevant for site-specific management (e. g. yield, biomass production, nutrient leaching). The interpreted, spatially highly resolved sensor output allows to drive the models simulating the spatio-temporal dynamic of soil state variables and to actualize simulated states, such as water and nutrient availability throughout different crop growing phases.

ZALF is contributing to different work packages within the I4S joint research project, which combines the scientific expertise of ten institutions. In the work package »soil sensors«, ZALF participates in field campaigns at different test sites all over Germany that are characterised by variable soil and site conditions. The aim of these campaigns is to apply and test new and existing on-the-go sensors and to simultaneously investigate the distribution of soil conditions with conventional methods. ZALF is responsible for collecting and analysing reference soil samples and for comparing different sensor outputs with analytical results using suitable statistical approaches.

In the work package »models«, ZALF is testing the applicability of the models HERMES and MONICA regarding their response to within-field variability in site conditions. As a first step, this includes the retrospective simulation of long-term field trials focussing on the species-specific crop development in relation to the site-specific water and nitrogen (N) use efficiency. Secondly, newly established field trials are the basis for improving the N modelling algorithms, which estimate soil nitrogen availability as well as the N demand of different crops. To this end, essential crop and soil variables are monitored regularly during each growing season (e. g. biomass, N in crop and soil, phenology).

The valid N algorithms are then applied as real-time simulations and model-based recommendations for selected test sites and the site-specific resource savings are assessed. In the upcoming funding period, this approach will be expanded to other nutrients like phosphorous, potassium and magnesium. The presented sensor-model system will finally be integrated into a decision support system for site-specific precision agriculture.
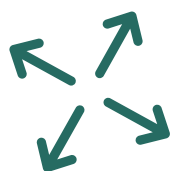
CLIMATE CHANGE ADAPTATION: MODEL-BASED CO-DESIGN OF CROPPING SYSTEMS

PETER ZANDER, JOHANN BACHINGER, RALF BLOCH, MORITZ RECKLING, JOHANNES SCHULER

Field experiment with organic soybeans directly sown into crimped winter rye at Müncheberg research station.

Several studies have shown that climate change will also affect European agriculture, with varying implications in different European countries and geographical regions. The projects MACSUR and Climate-CAFÉ developed methodologies to assess how food can be sustainably produced in Europe under conditions of climate change and how European cropping systems can be adapted to climate change. Researchers from the Institutes of Land Use Systems and Socio-Economics have contributed with field experiments and modelling expertise to these two projects, which were funded under the Joint Programming Initiative on Agriculture, Food Security and Climate Change (FACCE-JPI).

The aim of the project Climate-CAFE was to evaluate different adaptation strategies based on participatory research by mobilizing 10 »adaptation pilots« (groups of farmers and other actors of the agricultural sector). These pilot studies were distributed throughout various European pedo-climatic regions covering the wide range of agricultural conditions from Finland to Spain and Scotland to Eastern Germany. MACSUR was a network of more than 300 scientists in 18 countries, aiming to improve and integrate models of crop and livestock production, farms, as well as national and international agri-food markets through interdisciplinary collaboration. Furthermore, it focused on the analysis of the effects of climate change on major farming systems in Europe. ZALF contributed to these projects with the models HERMES, MODAM and ROTOR as well as with impact assessment studies.

The adaptation of agricultural systems to the effects of climate change requires region-specific adaptive measures. Such measures were identified and tested within a farmers-network in the German federal state of Brandenburg. Agricultural practices such as reduced tillage, intercropping and crop diversification were identified as the main adaptation strategies, while irrigation, timing of drilling and mixed cropping were considered less relevant or feasible.

Based on these results, new soybean cropping systems were tested as adaption measures by conducting on-farm and on-station experiments. By evaluating and adjusting these experiments, the team aimed at increasing diversification and decreasing risks in farming practices. The above picture shows that e. g. winter rye was successfully used as winter catch crop and mulch for soy bean production.

Together with researchers from Wageningen University (WUR) and the French National Institute of Agriculture Research (INRA), ZALF also studied the effects of climate change on a typical arable farm in Southern France by applying two bio-economic farm models (MODAM and FarmDESIGN). Both models adjusted crop choice and cropping area to find optimal solutions for a set of objectives (profit, soil organic matter, labour use). The results show that little adaptation is needed to sustain stable profits, soil organic matter balance and labour use if irrigation water remains available. In case of water shortage, lower yields were expected with decreasing profits and soil organic matter balance.

The findings show that adaptation to climate change affects the entire farming system and requires further research from field to regional level. The results also help to sensitize stakeholders with respect to the necessary efforts for adapting to climate change.

SMART DELIVERY OF PUBLIC GOODS THROUGH AGRICULTURE

KATI HÄFNER, INGO ZASADA, ANNETTE PIORR

3,000 farms in Northern Germany received the questionnaire, which was also available online. We received 465 replies with 155 completely filled out Discrete Choice question sets.

Landscape, biodiversity, water quality, climate stability, soil and flood protection and viable rural areas are just a few examples of the public goods that agriculture provides for society. However, as there is no market for such goods, there is the risk that they are provided in a quantity lower than socially optimal or not in a sufficiently long term. The EU project PROVIDE is looking for intelligent ways to eliminate this risk. This includes the exchange between actors and stakeholders across sectoral and disciplinary boundaries and levels, as well as the analysis and further development of new or improved incentives, policy instruments and implementation tools.

Agri-environmental measures (AEM) are an appropriate and well-accepted instrument to promote the provision of public goods. Farmers receive compensatory payments for defined adjustments to their landscape management. The efficiency of an AEM, i.e. the achievement of its environmental objective, can often be improved through cooperation. A new AEM, aiming to promote public goods such as climate stability, biodiversity and water resources by increasing the water level in peatland areas, is the »Moorschonende Stauhaltung« (peatland conservation management), which has been introduced in Brandenburg in 2016.

In PROVIDE, we identify the factors that determine the willingness of farmers to participate in this AEM, thus providing explanatory approaches to the complex motivations and conditions of land use decisions in spatial contexts. Using an approach from experimental economics, the »Discrete Choice Experiment«, farmers were asked about their relative preference for the design of the AEM, taking into account various contractual conditions. The result showed that a 35 % higher compensation payment was necessary. Alternatively, the willingness to participate would be significantly increased if as well coordinative support for cooperation with neighbouring land users by the Water and Soil Association was to be provided as if options for processing or disposing biomass residues no longer suitable as feed were ensured.

This result from Northern Germany is included in the EU project alongside a variety of other analyses, maps and examples of successful practice from thirteen countries on the future of public goods from agriculture. The development of a toolbox, the systematic collection and provision of these facts, data, methods, analyses and discussion contributions is a further focus. In a multi-stage process, together with regional users and EU policy makers, we identify the type of tool and information content required for knowledge transfer, align it with the project results and convert it into appropriate formats such as information graphics, maps and example descriptions.

TOOLS FOR INNOVATIONS IN SUSTAINABLE LAND MANAGEMENT

MARIA BUSSE, KATHARINA DIEHL, ROSEMARIE SIEBERT, FELIX ZOLL

Riverside meadow in the Spreewald

Stakeholders and researchers jointly develop tools for the management of sustainable innovations for land management in two case studies, in order to increase the significance of existing niche solutions. The project ginkoo deals with specific problems of stakeholders and their innovative ideas. In the first case study, solutions for the valorization of small-scale wetlands in the Spreewald area are developed. A second regional case study called »Naturland« (ei care) points out and counteracts recent ethical problems in poultry production by rearing dual-purpose chicken.

Open and species-rich wetland meadows are characteristic of the cultural landscape of the Spreewald region and are taken for granted by tourists. However, the traditional use of biomass from wetland meadows as fodder and bedding for livestock is becoming less practicable and profitable.

In consequence, the management of small-scale and very wet meadows is often discontinued. This development threatens an important characteristic of the Spreewald region and decreases both the biodiversity and attractiveness of the landscape. In order to jointly develop approaches for the valorisation of wetland meadows, ginkoo brought together farmers, tourist agents, affected municipalities, land owners and conservationists. One specific solution is the thermal use of the biomass from wetland meadows, which is tested in a pilot project by a regional agricultural enterprise running a novel thermal plant.

The ginkoo project aims to integrate additional innovative ideas for an ideally holistic landscape conservation concept for the meadows of Spreewald region. ZALF scientists investigate the farmers' acceptance of such solutions and develop a tool for strategically increasing their acceptance. A second working package focusses on developing a criteria-based tool for sustainability assessment.

The dual-purpose chicken project »Naturland« (»ei care«) depicts an alternative to current practices in poultry farming in order to avoid negative ecological and ethical effects such as the mass killing of male chicks, which is a common practice in egg production.

With support of the ginkoo project, the market presence of »ei care« is to be improved. In addition, ginkoo aims to develop »ei care« into a feasible solution for small agricultural enterprises as part of integrated material cycles.

Within the »acceptance« work package, ZALF conducted a representative survey with 1,000 consumers from Berlin and Brandenburg. It focused on consumer attitudes regarding the ethical aspects of poultry farming and on the assessment of dual-purpose chicken. The survey results were used to design and implement measures for increasing acceptance, such as the involvement of customers and shop managers.

NETWORKING FOR THE LANDSCAPE:
CIVIL-PUBLIC-PRIVATE-PARTNERSHIPS

CLAUDIA SATTLER, BARBARA SCHRÖTER

Colors: green = nature conservation, blue = food production, purple = mixed interest
Shapes: triangles = civil, squares = public, circles = private actors

Water board »Oberspreewald«: The network of public, private and civil society actors on both sides of the »producing food vs. nature conservation boundary« creating a space for dialogue

Environmental problems often call for the collaboration of all concerned actors, since individual actors cannot address and solve these problems on their own. However, whenever multiple actors are involved, their interests can deviate substantially. Nevertheless, successful examples of collaborative governance show that boundaries between actors can be overcome and that collaboration can lead to an improved provisioning of ecosystem services at the landscape scale. The cp³ project analyzed several successful examples of collaborative governance for protected area management, based on networks between public, private and civil society actors.

We were particularly interested in how existing boundaries along the divide in viewpoints and opinions between public actors like the protection area administration and other environmental agencies, private actors like farmers and other land users, as well as civil society actors like environmental NGOs could be overcome. It was assumed that farmers are primarily interested in provisioning ecosystem services, i.e. the production of »food«, while environmental public agencies and NGOs are mostly concerned with securing regulating, supporting and cultural ecosystem services (e. g. water regulation, biodiversity, landscape aesthetics) for producing »nature conservation«.

The project employed the concept of boundary organizations (BOs), understood as governance arrangements which create strategic bridges between actors positioned on different sides of a »boundary«, to analyze if the selected collaborative governance approaches displayed the typical structural and procedural features of BOs. Structural features relate to institutional aspects for allowing participation, adaptation, reconciliation of interests, or reaching accountability and durability. Procedural features relate to established routines for convening events, translating between different knowledge types, building trust, or mediating conflict.

The analysis was based on empirical research conducted in the biosphere reserve Spreewald for two collaborative governance approaches: a citizen foundation and a water management board. For data analysis, we used social network analysis (Net-Map tool) based on personal interviews with governance actors.

Both governance arrangements displayed at least some of the structural and procedural features typical of BOs. The approaches allowed actors situated on different sides of the »producing food vs. nature conservation boundary« to negotiate common goals in favour of improved ecosystem service provisioning. This was possible because, in addition to self-serving interests, actors motives also included general public interests such as preserving the landscape as part of their mutual cultural heritage. Only by pooling the specific knowledge and resources of all actors they were able to address problematic issues at landscape scale, which they could not address individually. Both approaches helped to create a space for actors to engage in dialogue and to debate different viewpoints while at the same time ensuring that all actors could remain within their original professional boundaries.

THE YEAR

←

1ST HYDROLOGY IN BIODIVER-SITY RESEARCH In the new DFG project »Patterns of Evapotranspiration Changing throughout the Year«, a frequently postulated positive effect of high biodiversity is being examined: The concept of the »complementary use of ecological niches« states that plant stands with high biodiversity can better adapt to non-favourable environmental conditions such as less rainfall by compensating through better adapted or less demanding species. With regard to the water consumption of grassland sites, this hypothesis is examined using drone technology.

1ST HELPING TO SHAPE EURO-PEAN AGRICULTURAL POLICY 30 international researchers discussed at ZALF how the availability of »public goods«, such as biodiversity or clean drinking water, can be improved through policy measures. In the EU project »PROVIDE«, 14 European universities and research institutions are working on solutions. Initial results on the economic evaluation in 13 investigated European case study regions were presented at the project meeting and their use for comprehensive models and policy mechanisms were discussed.

1ST LEIBNIZ COMPETITION The research project »SOARiAL« was selected for funding from a total of 83 entries in the Leibniz Competition 2017. ZALF, three other Leibniz Institutes, and the Berlin Free University will be studying the spread of antibiotic-resistant germs in agrarian landscapes over the next three years. The main focus is on the atmospheric transport pathway.

JANUARY

11TH NEW GERMAN SUSTAINA-BILITY STRATEGY The relaunch of the Federal Government's sustainability strategy is explicitly aligned with the United Nations' Agenda 2030. Science is identified as an important player in the implementation of the strategy. In the area of soil fertility and as a contribution to food security, the joint research project »BonaRes« is cited as an important building block in which ZALF is involved.

FEBRUARY

21–25TH CONFERENCE IN INDIA Prof. Frank A. Ewert, Scientific Director of ZALF and Professor of Crop Production at the University of Bonn, spoke at the »Inter-Drought-V« in Hyderabad (India) to around 950 participants from more than 300 organisations and 55 countries. He emphasised the need for an integrated cross-scale research approach to reduce the risks of drought stress on yields and food security.

MARCH

9TH EVALUATION The Senate of the Leibniz Association recommended to the Federal Government and the State of Brandenburg that the joint funding of ZALF be continued for the next seven years. Since the last evalu-

ation in 2013, ZALF has been able to demonstrate significant improvements in important evaluation criteria, for example in scientific publications, the enhancement and reorientation of its strategic and thematic profile and in the restructuring of its administration, according to the Senate's statement.
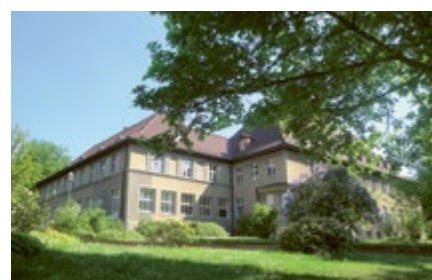
IN RETROSPECT

**12TH DOCUMENTING AGRICUL-
TURAL ENVIRONMENTAL MEAS-
URES WITH THE SMARTPHONE**
The presentation of a »Nature Conser-
vation App« (»NatApp«) for agricul-
tural workers and administrations

**2ND ONLINE OVERVIEW MAP
OF LONG-TERM FIELD TRIALS IN
GERMANY** The BonaRes Centre has
bundled freely available metadata on
long-term field trials in Germany and
compiled this into an interactive online
overview map. Its goal is to give the
long-term field trials greater visibility

**22ND CELEBRATION OF 25
YEARS OF ZALF** ZALF celebrated
its 25th anniversary with around 300
invited guests from science, politics
and practice: in the morning with a
scientific symposium on »Agricul-
tural landscape research in the context
of sustainability goals«, in the after-
noon with companions, sponsors and
partners during a festive ceremony.
Among the guests of honor was the
Federal Minister of Education and
Research, Prof. Johanna Wanka.

| APRIL | MAY | JUNE |

by ZALF and the German Farmers'
Association (DBV) aroused great inter-
est. EU Commission officials met in
Brussels to find out how the prototype
works and also discussed the poten-
tial for a noticeable simplification of
EU agricultural support. The trans-
fer of the »NatApp« into practice will
be supervised by ZALF. The project
is sponsored by the German Federal
Environmental Foundation (DBU).
The DBV and HELM-Software are
project partners.

www.naturschutz-app.de

and to make information about them
more accessible to the public.

The interactive online map offers vari-
ous search and display options.

**https://b-web-e.bonares.de/
uebersichtskarteDFV_en/**

25TH OPEN DAY Under the motto
»The future? Agriculture!«, more than
2250 young and old guests informed
themselves at more than 35 stations
about soil, water, and wind as well as
flora and fauna. A campus rallye with a
quiz invited visitors to join in the quest
for knowledge. A balloon on a crane
lifted guests up into the air and pro-
vided a rare view of the ZALF campus
and the district of Maerkisch-Oderland.
A diverse stage programme of research,
culture and music also awaited the
guests. Among other events, Dr. Chris-
tiane Peter was awarded the Research
Prize of the town of Muencheberg.

THE YEAR

←

2ND SPECIES PROTECTION BENEFITS ALL

Agricultural intensification is threatening more and more plant and animal species. The »Agriculture for Biodiversity« project aims to change this with the help of a nature conservation certificate. The project, which was scientifically accompanied by ZALF, has been processed by Detektor FM in images, sound and text.

https://bit.ly/2vB4Gke

24–26TH INTERNATIONAL EXCHANGE

The Land Use Systems Department at the Albrecht-Daniel-Thaer-Institute of the Humboldt-Universität zu Berlin, in cooperation with the Institute for Land Use Systems of ZALF, hosted the 61st Annual Conference of the Working Group Grassland and Fodder Production of the Society for Crop Production Sciences in Berlin / Paulinenaue. The main topic of the conference was »Sustainable grassland management on moorland sites«. The conference was attended by 115

7–8TH COMMITTED IN THE PHD NETWORK

Since its foundation in September 2016, the »Leibniz PhD Network« has been working for an improved exchange between doctoral researchers and a better representation of their interests within the Leibniz Association. At the annual general assembly, seven doctoral candidates were elected as the new steering

JULY	AUGUST	SEPTEMBER

7TH UNDERSTANDING CHANGE OF AGRI-FOOD SYSTEMS

The results of the research project »Future | Food | Commons« were summarized in two brochures and presented in Berlin's Prinzessinnengärten in July. The practice brochure »Alternative food networks« and the policy brochure »Alternative food networks: Fields of action for producers, consumers, policy-makers and administration« are available for download on the project website.

www.fufoco.net

participants from the fields of agricultural and environmental sciences, consulting and practice in Germany, Switzerland, Luxembourg, Poland and Belgium.
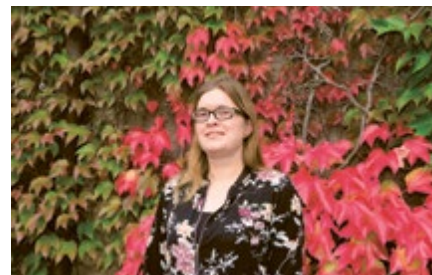
committee. Meike Weltin, a researcher in the EU project VITAL at ZALF, was elected as the new spokeswoman for the Environmental Sciences Section.

IN RETROSPECT

18TH   AWARD Inspired by a famous study by the economist Stephen Ziliak and Deirdre McCloskey, Meike Weltin and Jens Rommel from the Institute of Socioeconomics at ZALF presented an initial diagnosis of the misinterpretation of statistical significance in agricultural economic research and teaching. Their contribution was awarded the prize for the best presentation at the annual conference of the Society for Economic and Social Sciences in Agriculture (GEWISOLA).

21ST   FIRST SCIENCE DAY AT ZALF With a combination of scientific lectures and discussion rounds, the new internal format is intended to promote a lively scientific exchange. The positive feedback of the more than 100 participants results in the establishment of the Science Day as one of several regular scientific ZALF events.

24TH   BONARES EVALUATION
An international panel of experts confirmed that the BonaRes Centre has had a very successful start-up phase and that the partners involved have been successfully integrated into a virtual centre that is ideally equipped for the ambitious goal of providing scientific foundations for sustainable land use.

4–5TH   IDEAS FOR THE LAND
Land is essential. As a habitat, economic good and part of our culture. However, land is also at the centre of distribution conflicts between agriculture, energy supply, (housing) industry, tourism or transport. In order to find solutions for a responsible, forward-looking use of the resource land, nine teams of scientists and

OCTOBER	NOVEMBER	DECEMBER

28TH   A GUIDE TO CONFLICT RESOLUTION IN COLLABORATIVE PROJECTS COLLABORATIVE PROJECTS are time-limited, complex systems; they are designed and carried out by larger research consortia; they have a predominantly interdisciplinary orientation and require close cooperation between international researchers, particularly in the field of sustainable development. Conflicts can easily arise that delay or jeopardize the success of a project. This is where conflict prevention and conflict management systems (CPM) can help. Together with researchers from the Institute for Conflict Management at the European University Viadrina Frankfurt (Oder), a CPM system was developed and tested in the Transsec project coordinated by ZALF. The guide is available for download.

https://bit.ly/2HDFt31

22ND   ZALF AT THE COP23
ZALF was part of the German delegation to the 23rd UN Climate Change Conference »COP23« in Bonn and took part in expert discussions between politics, industry and business. ZALF is also actively involved in the »4per1000« initiative, which was the subject of a symposium at COP23.

www.4p1000.org

**Videointerview of Prof. Ewert:
http://bit.ly/2iW5rzu**

practitioners are working in the funding measure »Innovation Groups for Sustainable Land Management«. At a status conference, they met with other partners and sponsors and discussed proposed solutions. Initial results with an exemplary character for regions throughout Germany were made tangible with the aid of an interactive map.

www.ideen-fuer-das-land.de

25 YEARS OF ZALF: RESEARCH CENTRE CELEBRATES ITS ANNIVERSARY

JANINA FAGO, HENDRIK SCHNEIDER

On 22 June 2017, the Leibniz Centre for Agricultural Landscape Research (ZALF) celebrated its 25th anniversary with around 300 invited guests from the fields of science, politics and practice. A scientific symposium was held in the morning on the topic of »Agricultural landscape research in the context of sustainability goals« on the campus in Muencheberg. In the afternoon companions, sponsors and partners, along with the ZALF Executive Board and their guests reviewed 25 years of agricultural landscape research during a festive ceremony.

Muencheberg: A research site with a long tradition

ZALF – the Centre for Agricultural Landscape and Land Use Research – was founded as a »Blue List« institution in Muencheberg in 1992. Research at the site is based on a long tradition: as early as 1928, the Kaiser Wilhelm Institute for Plant Breeding Research was founded by its first director Erwin Baur. Following its relocation in 1945, the Institute was re-opened shortly afterwards as the Central Research Institute for Plant Breeding, then from 1952 it became the Institute for Arable Farming and Crop Breeding with a new focus and new director: Prof. Dr. Ruebensam. In 1970, both its name as well as its mission were changed: the Muencheberg Research Centre for Soil Fertility (FZB) focused on the industrial-scale intensification of crop production. From 1987, its research was extended further to cover ecologically and economically balanced land management. The FZB was formally dissolved in 1991. Upon the recommendation of the German Council of Science and Humanities, the birth of today's Leibniz Centre for Agricultural Landscape Research (ZALF) was approaching.

The development of ZALF:
Excellence and internationalization with a wealth of data

With the establishment of ZALF in Muencheberg in 1992, the research focus on site changed direction from maximizing production to environmentally friendly land use as well as the integration of complex relationships in agriculturally used areas. Existing research data, such as the GDR-wide soil evaluation data, were and are the basis of a trove of data that is still growing today. Local and regional knowledge have been gradually extended to an international level. The initial governing body of ZALF was the »Blue List Working Committee«, which was jointly financed by the Federal Government and the states. In 1995, this became the »Scientific Community Blue List« (WBL) and from 1997, the »Wissenschaftsgemeinschaft Gottfried Wilhelm Leibniz« (WGL), or »Leibniz Association« for short. Thus, a powerful umbrella association with an international focus on scientific excellence was established, which would have a formative effect on ZALF. A further landmark decision for the Muencheberg Research Centre came to pass in 2006: the transfer of the responsibility for funding federal states from the Ministry of Agriculture to the Ministry of Science and thus a broadening of the focus on research — from the doorstep into the whole world.

Research with a focus on transfer
as well as inter- and transdisciplinarity

The research results from ZALF are today not only received in professional circles, but through a strong focus on transfer are also presented to the general public. ZALF uses very different formats for this: from a digital online game on the subject of water management, to panel discussions with stakeholders from many parts of society, up to smartphone apps for agriculture, the spectrum is varied. Regular field days in agriculture allow for a lively exchange of insights relating to the production of agricultural products while facing regional challenges, such as climate change, and are thus an excellent connection to practice.

The problems facing farmers, but also other relevant actors from industry, politics and public administration, characterize the research at ZALF. Actors from a wide variety of disciplines and social groups have been successively incorporated into the research and the transfer of knowledge under the heading of »transdisciplinarity«. The starting point was the »GRANO« joint research project which was launched in 1997. Transdisciplinary research was carried out systematically at ZALF for the first time: through GRANO, landscape planners, scientists, farmers and government representatives jointly pursued the objective of exploring the conditions required for sustainable agricultural landscape development in selected regions of Brandenburg. Obstacles, but above all ways of converting environmental knowledge into practical action were identified.

View of the main ZALF building at the Muencheberg site

Ingrid Onasch, technical staff member at
ZALF, analyzing a soil sample

The involvement of the general public in the research efforts of ZALF has today led
to one of the most successful citizen science projects in Germany: Researchers map
mosquitoes with the help of the population in their mosquito atlas.

Natural and social scientists on an international mission

The more intensive inter- and transdisciplinary research orientation is due not least
to a speciality at ZALF: the linking of scientific phenomena with economic and social
aspects. Research topics with increasingly global weighting established themselves
from the very beginning with the founding of the Institute of Socio-Economics:
Food security, landscape functioning, ecosystem services and impact research are
but a few of the keywords here.

The renowned expert conference »Tropentag« (»Tropics Day«) was a milestone in
the internationalization strategy. Jointly with the Humboldt-Universität zu Berlin in
2015, ZALF brought the largest Convention on International Agricultural Research
back to Berlin after eleven years. More than 1,000 participants from around 80 coun-
tries met to discuss strategies for food security, a more equitable use of resources
and the fight against poverty. In the same year, ZALF, together with the Helmholtz
Centre for Environmental Research (UFZ), took over the coordination of the Fed-
eral Ministry of Education and Research »BonaRes« program (Soil as a sustainable
resource for the bioeconomy). The research consortium, comprising a total of ten
interdisciplinary collaborative research projects, has set itself the task of building
up a worldwide unique virtual center in order to collect, to network and to make
available knowledge of soil functions.

Data collection and data usage:
Research on the scales of space and time

In order to develop concrete tools for the complex change processes in agricultural
landscapes, it is essential to have data in different time and space scales: ZALF has
a unique variety of long-term relevant data as well as experience in handling this.
The ZALF research station with a total area of 150 ha and three different locations
plays a special role here. The test areas in Muencheberg are characterized by a
sandy landscape. The widespread dry and sandy soils in Brandenburg provide ideal
conditions for research trials with a particular focus on aspects of climate change.
The Paulinenaue site in turn is characterized by wet soil conditions — among other

things, extensive grazing management in moor and grassland regions is tested here. The third site in the catchment area of the Quillow river in the Uckermark region is distinguished by relatively good soil and is characteristic of large parts of Central Europe. The »AgroScapeLab Quillow« here is ZALF's landscape laboratory: various measurement techniques are bundled together and geo-information is recorded and stored with measurement data in different dimensions from the soil, ground water or from the air. This »treasure trove of data« has grown over more than 25 years, and the research questions are as diverse as the data itself: from the intensive use and non-use of land, different tillage intensities, to the cultivation of various forms of crop rotation and accompanying vegetation, up to their impacts for example on erosion or the carbon balance of agricultural landscapes.

Digitalization and Agriculture 4.0

Through progressive digitization and developments in the field of »Big Data«, completely new opportunities are opening up under the heading »Agriculture 4.0« for the use, processing and provision of these complex data sets: in experiments in the laboratory, in climatic chambers or at the research station on a field and a landscape scale, ZALF generates and cross-links data which feeds a further pet research project in Muencheberg: computer-aided modelling. Using this, the scientists are able to explain the interactions between individual processes right up to the landscape level—and thereby also transfer research results to other regions and sections of the landscape.

With more than 163 partners in 18 countries in the meantime, ZALF is not only active in domestic agriculture today, but in a global context is also contributing to solving the challenges of the future at the landscape level.

The opening ceremony speakers (f.l.t.r.): Min. Dir. Clemens Neumann, Henrik Wendorff, Cornelia Rosenberg, State Minister Jörg Vogelsänger, former Federal Minister Prof. Johanna Wanka, Gernot Schmidt, Ludolf von Maltzan, Dr. Wolfgang Kasten, Prof. Frank A. Ewert. Not pictured speaker: Anita Beblek.

ANNEX

FACTS & FIGURES

325
Employees
(among them **159** scientists)

4905
Visitors

27
Employees doing
academic teaching

56
Tasks and offices in
scientific boards and bodies

5160
Newspaper articles

211
Peer-reviewed publications

71
Scientific conferences
and workshops

42
Colloquia

6.4 million €
Total amount of
third party money

21.5 million €
Basic funding

27.9 million €
Total budget

23%
Percentage of third party money
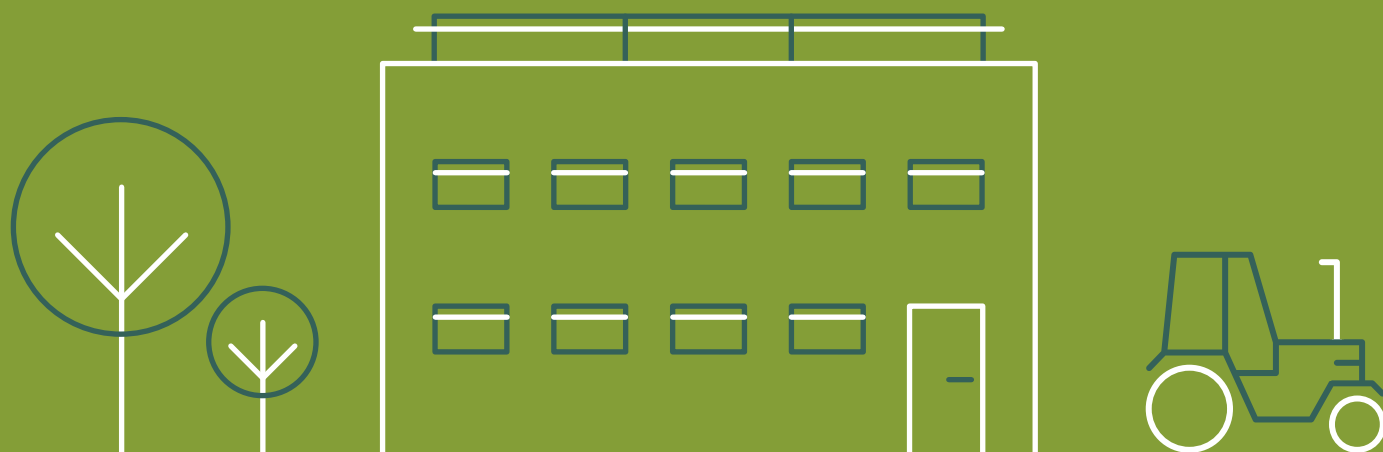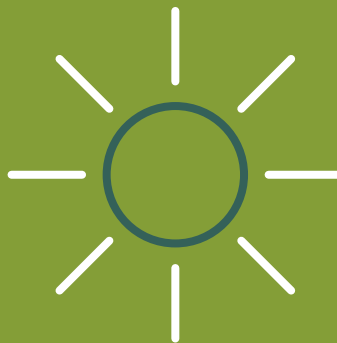
11

New doctoral researchers

14

Completed doctoral theses

29

Diplomas, master theses,
bachelor theses

27

Newly started projects

163

Cooperating partners
in **18** countries

1

Patent
Lysimeter flow rate control
(patent holder: ZALF & UGT GmbH)

1

Spin-off

150

Hectares of ZALF
experimental sites

FINANCES

EXPENSES DURING BUDGET YEAR 2017*

PAYROLL EXPENSES	17,280
ADMINISTRATION EXPENSES	5,959
FACILITY MAINTAINANCE EXPENSES	466
FACILITY INVESTMENTS	1,197
EQUIPMENT INVESTMENTS	1,365
OTHER EXPENSES	1,219
CASH HOLDINGS	8,605
TOTAL	**36,091**
	IN THOUSAND EUROS
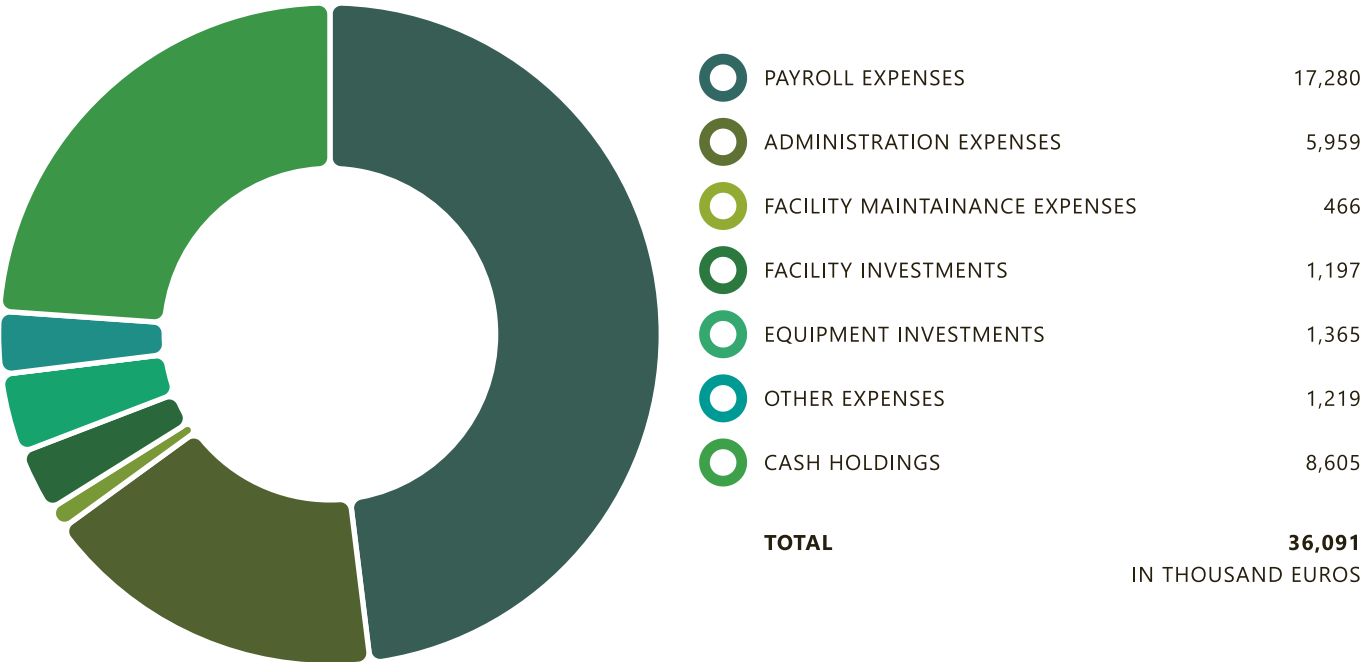
CONTRIBUTIONS OF THIRD PARTIES IN BUDGET YEAR 2017*				
	GRF	449	PRIVATE COMPANIES	273
	FEDERAL FINANCED PROJECTS	4,204	SAW	125
	STATE FINANCED PROJECTS	138	OTHERS	242
	EU	542	FOUNDATIONS	142
	ERANET	258		IN THOURSAND EUROS

21.5 MILLION CORE FINANCING	6.4 MILLION TP FUNDING

CORE FINANCING BY THE BRANDENBURGIAN MINISTRY OF SCIENCE, RESEARCH AND CULTURE (MWFK) AND THE FEDERAL MINISTRY OF FOOD AND AGRICULTURE (BMEL)

MANAGEMENT, BOARDS & COMMITTEES

ASSEMBLY OF MEMBERS	EXECUTIVE BOARD		SCIENTIFIC ADVISORY BOARD
Chair: Dr. C. Herok Ministry of Science, Research and Culture, Brandenburg	**Scientific Director:** Prof. Dr. F. A. Ewert	**Administrative Director:** Cornelia Rosenberg	**Chair:** Prof. Dr. H. Vereecken

Directorate Public Relations

Administration and Services

ZALF BOARD

INSTITUTE OF SOIL LANDSCAPE RESEARCH	INSTITUTE OF LANDSCAPE BIOGEO-CHEMISTRY	INSTITUTE OF LANDSCAPE SYSTEMS ANALYSIS	INSTITUTE OF LAND USE SYSTEMS	INSTITUTE OF LANDSCAPE HYDROLOGY	INSTITUTE OF SOCIO-ECONOMICS
Head: Prof. Dr. M. Sommer	**Head:** Dr. habil. S. Kolb	**Acting Head:** Dr. C. Nendel	**Head:** Prof. Dr. S. D. Bellingrath-Kimura	**Head:** Prof. Dr. G. Lischeid	**Head:** Prof. Dr. K. Müller

AGRICULTURAL LANDSCAPE DATA CENTRE

Data Provision   Primary Data Generation

SCIENTIFIC ADVISORY BOARD OF ZALF

Prof. Dr. Harry Vereecken
Research Centre Jülich, Institute of Bio- and Geosciences
Chair of the Scientific Advisory Board

Dr. Dr. habil. Stefan Mann
Federal Department of Economic Affairs, Education and Research, Agroscope (CH)
Vice Chair of the Scientific Advisory Board

Prof. Dr. Klaus Butterbach-Bahl
Karlsruhe Institute of Technology, IMK-IFU

Prof. Dr. Nina Buchmann
ETH Zürich, Department of Environmental System Science (CH)

Prof. em. Dr. Peter Gregory
University of Reading (UK)

Prof. Dr. Bernd Hansjürgens
Martin-Luther-Universität Halle-Wittenberg | UFZ

Prof. Dr. Martin Kaupenjohann
Technische Universität Berlin, Department of Ecology, Soil Science Group

Dr. Laurent Philippot
INRA Dijon (FR)

Prof. Dr. Andrea Emilio Rizzoli
University of Applied Sciences of Southern Switzerland, IDSIA (CH)

Prof. Dr. Christine Watson
Scotland's Rural College (UK) | Swedish University of Agricultural Sciences (SE)

MEMBERS OF ZALF

Dr. Claudia Herok
Ministry of Science, Research and Culture (MWFK, Ref. 22), Brandenburg
Chair of the Assembly of Members

Bernt Farcke
Federal Ministry of Food and Agriculture
Vice Chair of the Assembly of Members

Dr. Klaus-Peter Michel
Federal Ministry of Education and Research

Peter Schubert
Ministry of Rural Development, Environment and Agriculture, Brandenburg

Prof. Dr. Wolfgang Bokelmann
Humboldt-Universität zu Berlin, Faculty of Life Sciences

Prof. Dr. Robert Seckler
University of Potsdam, Vice President for Research and Young Scientists

Udo Folgart
Agro-Glien GmbH

Prof. Dr. Klement Tockner
FWF Der Wissenschaftsfonds (AT)

INSTITUTES OF ZALF

BLF The **Institute of Soil Landscape Research (BLF)** studies structures, processes and functions of soil landscapes, meaning long-standing soil associations within their current landscape ecological context. For a fundamental understanding of the development and functioning of soil landscapes, soil processes are analyzed in their dependency on spatio-temporally variable structures — all the way from the micrometer scale up to the landscape scale.
› Head of Institute: Prof. Dr. Michael Sommer

LBG The **Institute of Landscape Biogeochemistry (LBG)** investigates principles of C and N cycles in agricultural landscapes and their influences on the responses of landscape processes to climate change and land use management. Drivers and regulators of landscape processes are microbiomes, plants, and plant-soil-biome interactions, which are studied at the laboratory, greenhouse and landscape level.
› Head of Institute: PD Dr. Steffen Kolb

LSA The **Institute of Landscape Systems Analysis (LSA)** explores ecosystem functions and services of agricultural landscapes. Methods and models for analysis and assessment purposes are developed to facilitate a better understanding and evaluation of relevant processes. These are the foundation for an integrated sustainability impact assessment of climate change, policy making and societal demands on agricultural landscapes.
› Acting Head of Institute: Dr. Claas Nendel

LSE The **Institute of Land Use Systems (LSE)** develops sustainable land use systems and studies their contributions to the provision of ecosystem services in a landscape context. New assessment tools and indicators are created that can be used for simulation models as well as new governance approaches.
› Head of Institute: Prof. Dr. Sonoko D. Bellingrath-Kimura

LWH The **Institute of Landscape Hydrology (LWH)** develops methods for sustainable water management that simultaneously ensure agricultural production, maintain ecosystem services and protect biodiversity. The institute's work is based on a sound understanding of the interplay between hydrological, biogeochemical and biological processes including their interactions under changing environmental conditions.
› Head of Institute: Prof. Dr. Gunnar Lischeid

SO The **Institute of Socio-Economics (SO)** investigates economic, social and political aspects of the sustainable use of agricultural landscapes. Research questions address actor behavior, governance approaches as well as innovation processes. Due to the complexity of the research questions, disciplinary investigations are complemented by inter- and transdisciplinary approaches.
› Head of Institute: Prof. Dr. Klaus Müller

DOCTORAL RESEARCHERS

NEW IN 2017

Arrekhi, Abdol Azim
Inst. of Land Use Systems
Supervisor at ZALF: Dr. Johann Bachinger, Dr. Ralf Bloch
Brandenburg University of Technology
Cottbus-Senftenberg
Supervisor: Prof. Dr. Michael Schmidt

Boltayev, Tolmasbek
Inst. of Land Use Systems
Supervisor at ZALF: Prof. Dr. Sonoko D.
Bellingrath-Kimura
Humboldt-Universität zu Berlin
Supervisor: Prof. Dr. Sonoko D. Bellingrath-Kimura

Calitri, Francesca
Inst. of Soil Landscape Research
Supervisor at ZALF: Prof. Dr. Michael Sommer
University of Zurich
Supervisor: Prof. Dr. Markus Egli

Hafner, Johannes
Inst. of Socio-Economics
Supervisor at ZALF: Dr. Stefan Sieber, Dr. Götz Uckert
Humboldt-Universität zu Berlin
Supervisor: Prof. Dr. Klaus Müller

Hemminger, Karoline
Inst. of Land Use Systems
Supervisor at ZALF: Dr. Hannes J. König
Humboldt-Universität zu Berlin
Supervisor: Prof. Dr. Sonoko D. Bellingrath-Kimura

Kersten, Anne-Katrin
Inst. for Landscape Biogeochemistry
Supervisor at ZALF: Dr. Peter Lentzsch
Humboldt-Universität zu Berlin
Supervisor: Prof. Dr. Carmen Büttner

Mahmood, Nasir
Inst. of Socio-Economics
Supervisor at ZALF: Prof. Dr. Harald Kächele
Humboldt-Universität zu Berlin
Supervisor: Prof. Dr. Klaus Müller

Münch, Steffen
Inst. of Soil Landscape Research
Supervisor at ZALF: Dr. Roger Funk
University of Potsdam
Supervisor: Prof. Dr. Michael Sommer

Reinke, Henrik
Inst. of Land Use Systems
Supervisor at ZALF: Dr. Hannes J. König
University of Veterinary Medicine Hannover, Foundation
Supervisor: Prof. Dr. Ursula Siebert

Wenz, Elena
Inst. of Land Use Systems
Supervisor at ZALF: Dr. Hannes J. König
Martin-Luther-University Halle-Wittenberg
Supervisor: Prof. Dr. Christine Fürst

Zoll, Felix
Inst. of Socio-Economics
Supervisor at ZALF: Dr. Rosemarie Siebert
Humboldt-Universität zu Berlin
Supervisor: Prof. Dr. Klaus Müller

SCHOLARSHIP HOLDERS

Name	Country	Institute	Sponsorship
Batunacun	P. R. China	Landscape Systems Analysis	Chinese Scholarship Council
Boltayev, Tolmasbek	Uzbekistan	Land Use Systems	ERASMUS Mundus Action 2 (EMA2)
Dam, Thi H. T.	Vietnam	Land Use Systems	Vietnam International Education Development, Ministry of Education and Training
Egamberdieva, Dr. Dilfuza	Uzbekistan	Landscape Biogeochemistry	Alexander von Humboldt-Foundation
Hampf, Anna C.	Germany	Landscape Systems Analysis	Heinrich-Böll Foundation
Hemminger, Karoline	Germany	Land Use Systems	Marianne and Dr. Fritz Walter Fischer- Foundation
Huynh, Thanh H.	Vietnam	Land Use Systems	Vietnam International Education Development, Ministry of Education and Training
Iqbal, Muhammad A.	Pakistan	Landscape Systems Analysis	Alexander von Humboldt Foundation
Latif, Muhammad S.	Pakistan	Socio-Economics	International Research Support Initiative Program, Government of Pakistan
Mahmood, Nasir	Pakistan	Socio-Economics	Punjab Higher Education Commission, Punjab
Naqvi, Syed M. R.	Pakistan	Socio-Economics	50 Overseas Scholarships, University of Agriculture, Faisalabad
Ostermann, Emu-Felicitas	Japan	Land Use Systems	Japan Public Private Partnership Student Study Abroad Program (Tobiate! Young Ambassador Program)
Reinke, Henrik	Germany	Land Use Systems	Marianne and Dr. Fritz Walter Fischer- Foundation
Sam, Anu S.	India	Socio-Economics	DAAD
Selecky, Tomas	Germany	Land Use Systems	DBU
Sun, Jin	P. R. China	Socio-Economics	Chinese Scholarship Council
Susman, Roni	Indonesia	Socio-Economics	Indonesian Endowment Fund for Education
Thai, Thi H.	Vietnam	Land Use Systems	Vietnam International Education Development, Ministry of Education and Training
Wambura, Frank J.	Tanzania	Landscape Hydrology	DAAD
Wang, Dr. Meng	P. R. China	Landscape Systems Analysis	Chinese Scholarship Council
Weißhuhn, Peter	Germany	Land Use Systems	DBU
Welidehana, Fikadu G.	Ethiopia	Landscape Systems Analysis	DAAD
Wenz, Elena	Germany	Land Use Systems	Marianne and Dr. Fritz Walter Fischer Foundation
Zoghi, Zohreh	Iran	Land Use Systems	Ministry of Science, Research and Technology, Islamic Republic of Iran
Zulfiqar, Hasan	Pakistan	Socio-Economics	University of Agriculture, Faisalabad

DOCTORAL THESES

COMPLETED 2017

Arodudu, Oludunsin Tunrayo
Inst. of Land Use Systems
Sustainability assessment of
agro-bioenergy systems using
energy efficiency indicators
Supervisor at ZALF:
Prof. Dr. Katharina Helming
University of Potsdam
Supervisor: Prof. Dr. Hubert Wiggering

Arshad, Muhammad
Inst. of Socio-Economics
Multidimensional impacts of climate
change and climate variability on
farming systems in Pakistan:
implications for adaptation and
sustainable rural development
Supervisor at ZALF:
Prof. Dr. Harald Kächele
Humboldt-Universität zu Berlin
Supervisor: Prof. Dr. Klaus Müller

Brunet Navarro, Pau
Inst. of Landscape Systems Analysis
The vulnerability of organic farming
to climate change effects in the Federal
State of Brandenburg, Germany
Supervisor at ZALF:
Dr. Hubert Jochheim
UCL - Catholic University Louvain
Supervisor: Prof. Dr. Bart Muys

Gao, Yongbo
Inst. of Landscape Hydrology
Dealing with missing data in
hydrology — Data analysis of
discharge and groundwater time-
series in Northeast Germany
Supervisor at ZALF:
Prof. Dr. Gunnar Lischeid
Freie Universität Berlin
Supervisor: apl. Prof. Dr. Christoph Merz

Hermanns, Till
Inst. of Land Use Systems
Sustainability Impact Assessment of
land use scenarios in the area of ten-
sion between space production and re-
production — Development of an ana-
lytical framework at the regional level
Supervisor at ZALF:
Prof. Dr. Katharina Helming
Georg-August-Universität Göttingen
Supervisor: Prof. Dr. Heiko Faust

Hohenbrink, Tobias
Inst. of Landscape Hydrology
Turning a problem into a solution:
heterogeneities in soil hydrology
Supervisor at ZALF:
Prof. Dr. Uwe Schindler
University of Potsdam
Supervisor: Prof. Dr. Gunnar Lischeid

Nitzsche, Kai
Inst. of Landscape Biogeochemistry
Applying isotope geochemistry to
identify mechanisms regulating the
aquatic-terrestrial carbon and nitro-
gen dynamics across scales in a mo-
raine landscape
Supervisor at ZALF:
Dr. Katrin Premke, Dr. Zachary Kayler,
Prof. Dr. Arthur Geßler
Humboldt-Universität zu Berlin
Supervisor: Prof. Dr. Jutta Zeitz

Peter, Christiane
Inst. of Landscape Systems Analysis
Modelling greenhouse gas emissions
and cumulative energy demand of
energy crops in rotation using the
Life Cycle Assessment aproach —
Challenges and potential solutions
Supervisor at ZALF: Dr. Claas Nendel
Justus-Liebig-Universität Gießen
Supervisor: Prof. Dr. Joachim Aurbacher

Rieckh, Helene
Inst. of Soil Landscape Research
Hydropedological analysis of erosion-
affected soils in a hummocky ground-
moraine landscape — Interactions of
water flow, dissolved carbon and particle
transport, crop growth, and pedogenesis
Supervisor at ZALF:
PD Dr. Horst H. Gerke
University of Potsdam
Supervisor: Prof. Dr. Michael Sommer

Schindler, Jana
Inst. of Land Use Systems
Sustainability impact assessment for
improved food security — The benefit
of local stakeholder participation
Supervisor at ZALF:
Dr. Frieder Graef, Dr. Hannes J. König
Humboldt-Universität zu Berlin
Supervisor: Prof. Dr. Klaus Müller

Specht, Kathrin
Inst. of Socio-Economics
The introduction and implementation
of »zero-acreage farming« (ZFarming).
Potentials, limitations, and acceptance
Supervisor at ZALF:
Dr. Rosemarie Siebert
Humboldt-Universität zu Berlin
Supervisor: Prof. Dr. Klaus Müller

von Rein, Isabell
Inst. of Landscape Biogeochemistry
Plant and soil microbial responses to
drought stress in different ecosys-
tems: the importance of maintaining
the continuum
Supervisor at ZALF:
Dr. Andreas Ulrich, Dr. Katrin Premke,
Dr. Zachary Kayler
Humboldt-Universität zu Berlin
Supervisor: Prof. Dr. Arthur Geßler

Wambura, Frank Joseph
Inst. of Landscape Hydrology
Analysis of anthropogenic impacts
on water resources in the Wami River
basin, Tanzania
Supervisor at ZALF:
Dr. Ottfried Dietrich
University of Potsdam
Supervisor: Prof. Dr. Gunnar Lischeid

Zscheischler, Jana
Inst. of Socio-Economics
Transdisciplinary research in the
field of land use science: concepts,
practice, and dimensions of success
Supervisor at ZALF:
apl. Prof. Dr. Thomas Weith
Humboldt-Universität zu Berlin
Supervisor: Prof. Dr. Klaus Müller

GUESTS & FELLOWS

GUESTS WITH RESEARCH STAYS AT ZALF

Asseng, Prof. Dr. Senthold
Directorate, Inst. of Landscape
Systems Analysis
University of Florida, USA

Getachew Welidehanna, Fikadu
Inst. of Landscape Systems Analysis
Haramaya University, Ethiopia

Iturri, Dr. Antonela
Inst. of Soil Landscape Research
National University of La Pampa,
Argentina

Leonovich, Elena
Inst. of Landscape Biogeochemistry
National Academy of Sciences of
Belarus, Belarus

Li, Dr. Yan
Inst. of Socio-Economics
Nanjing Institute of Geography
and Limnology / Academy of Sciences,
P. R. China

Martre, Dr. Pierre
Directorate, Inst. of Landscape
Systems Analysis
INRA Montpellier, France

Naqvi, Syed M. R.
Inst. of Socio-Economics
University of Agriculture -
Faisalabad, Pakistan

Soininen, Prof. Janne
Inst. of Landscape Biogeochemistry
University of Helsinki, Finnland

Teixeira, Dr. Edmar
Directorate, Inst. of Landscape
Systems Analysis
Lincoln University New Zealand,
New Zealand

Terleev, Prof. Dr. Vitaly V.
Inst. of Landscape Systems Analysis
Peter the Great St. Petersburg
Polytechnic University, Russia

Tilahun Zeleke, Dr. Ketema
Inst. of Landscape Systems Analysis
Charles Sturt University, Australia

Wang, Dr. Meng
Inst. of Landscape Systems Analysis
China Agricultural University Beijing,
P. R. China

Wang, Prof. Dr. Hongyang
Inst. of Socio-Economics
Nanjing University, P. R. China

Zoghi, Zohreh
Inst. of Landscape Systems Analysis
Ministry of Science, Research and
Technology, Iran

Zulfiqar, Hasan
Inst. of Socio-Economics
University of Agriculture -
Faisalabad, Pakistan

FELLOWS

Burkhard, PD Dr. habil. Benjamin
Inst. of Land Use Systems
Leibniz Universität Hannover,
Germany

Geßler, Prof. Dr. Arthur
Inst. of Landscape Biogeochemistry
Eidg. Forschungsanstalt für Wald,
Schnee und Landschaft WSL,
Switzerland

Kimaro, Dr. Anthony
Inst. of Socio-Economics
World Agroforestry Centre (ICRAF),
Tanzania

Kleber, Prof. Dr. Markus
Inst. of Soil Landscape Research
Oregon State University, USA

Nautiyal, Prof. Dr. Sunil
Inst. of Socio-Economics
Institute for Social and Economic
Change, India

Oguntunde, Prof. Dr. Philip G.
Inst. of Landscape Hydrology
Federal University of Technology -
Akure, Nigeria

NEW THIRD PARTY FUNDED PROJECTS

Title	Duration	Funding	Institutes
Food, Natural, Manmade-Security Crisis and Driving Forces for Migration	January 2017–June 2018	Leibniz Research Alliance »Crises in a Globalised World«	Socio-Economics
Land use change in savannahs and grasslands—solutions through political commitment, land use planning and best management practices (SuLu2)	January 2017–August 2019	World Wide Fund For Nature (WWF)	Socio-Economics
Patterns of evapotranspiration changing throughout the year (pETchy)	January 2017–December 2019	German Research Foundation (DFG)	Soil Landscape Research, Landscape Hydrology
Potential analysis of the cocoa value chain in Cameroon (IITA Value-CC)	January 2017–February 2019	International Institute of Tropical Agriculture (IITA), Cameroon	Socio-Economics
Development of a monitoring and risk assessment system for extreme weather events for providing decision support for extreme weather management in agriculture (EMRA)	February 2017–January 2020	Federal Ministry of Food and Agriculture (BMEL)	Soil Landscape Research
Spread of antibiotic resistance in an agrarian landscape (SOARiAL)	February 2017–January 2020	Leibniz Competition, Cooperative Excellence	Soil Landscape Research
Monitoring the temporal changes of surface properties regarding the PM-emission potentials in the mining area Nochten	April 2017–November 2018	Lausitz Energie Bergbau AG	Soil Landscape Research
Meta-analysis of the benefits of organic farming for environment and society	May 2017–March 2018	Federal Ministry of Food and Agriculture (BMEL)	Land Use Systems
Vegetation surveys on permanent plots in the lower Havel river valley	May 2017–December 2018	Landesamt für Umwelt, Brandenburg (LfU)	Land Use Systems
Development of a biological system controlling the causative agent of the ash dieback Hymenoscyphus fraxineus (Frax-ProMik)	June 2017–May 2020	Federal Ministry of Food and Agriculture (BMEL)	Landscape Biogeochemistry
Human-wildlife conflicts in agricultural landscapes of UNESCO-Biosphere reserves (LandSTRAT)	June 2017–May 2020	Marianne and Dr. Fritz Walter Fischer- Foundation	Land Use Systems
Innovation network to improve soybean production under the global change (INNISOY)	June 2017–May 2020	Federal Ministry of Education and Research (BMBF)	Land Use Systems, Landscape Systems Analysis
Biodiversity, interaction and nitrogen cycle in grassland soil (BE-Cult)	July 2017–December 2019	German Research Foundation (DFG)	Landscape Biogeochemistry
Land-use intensity effects on soil methane cycling microbes in grassland and forest soils	July 2017–December 2019	German Research Foundation (DFG)	Landscape Biogeochemistry
Solute mass transfer through the macropore-matrix interface during preferential flow in structured soils: model development (SoMaTra)	July 2017–June 2020	German Research Foundation (DFG)	Soil Landscape Research

Title	Duration	Funding	Institutes
Model based environmental impact assessment of the new energy crop Szarvasi grass in comparison to annual energy crops (BRAWU)	August 2017–January 2018	Landwirtschaftskammer NRW	Land Use Systems
Resource management in the salinized and drought stress-endangered irrigation areas of Central Asia for adapting to climate change (BioWAT I)	August 2017–July 2019	Federal Ministry of Education and Research (BMBF)	Landscape Hydrology
Developing and testing a process to increase and secure the quality of grass silage production	September 2017–December 2020	EU	Land Use Systems
Digital Agricultural Knowledge and Information System (DAKIS): Innovation integration for landscape smart agriculture	September 2017–February 2018	Federal Ministry of Education and Research (BMBF)	Land Use Systems, Landscape Systems Analysis, Socio-Economics
Investigation of an alternative cropping system on former arid and semi-arid rangelands in the Golestan province, Iran (ARIAN)	September 2017–August 2020	Federal Ministry of Food and Agriculture (BMEL)	Land Use Systems
Landscape genetics of insect-pollinated forest herbs in changing agricultural landscapes	November 2017–January 2021	German Research Foundation (DFG)	Land Use Systems
Quantification of small-scale physicochemical and microbiological properties of intact macropore surfaces in structured soils (InnoForEst)	November 2017–October 2019	German Research Foundation (DFG)	Soil Landscape Research, Landscape Biogeochemistry
Smart information, governance and business innovations for sustainable supply and payment mechanisms for forest ecosystem services	November 2017–October 2020	EU Horizon 2020	Socio-Economics
Wise use of drained peatlands in a bio-based economy: Development of improved assessment practices and sustainable techniques for mitigation of greenhouse gases (PEATWISE)	November 2017–November 2020	EU Horizon 2020	Socio-Economics
Meeting desired protein contents for malting barley (Barley-IT)	December 2017–November 2019	EU EIT Climate-Kic	Landscape Systems Analysis
Satellite-based Information for grassland management (SattGrün)	December 2017–November 2020	Federal Ministry of Food and Agriculture (BMEL)	Landscape Systems Analysis
Urban and peri-urban agriculture in the EU (UPUA)	December 2017–April 2018	EU	Socio-Economics

COOPERATION (SELECTED)

NATIONAL

UNIVERSITIES

- Alpen-Adria-Universität Klagenfurt
- Brandenburg University of Technology Cottbus-Senftenberg
- Eberswalde University for Sustainable Development
- European University Viadrina
- Freie Universität Berlin
- Friedrich Schiller University Jena
- Georg-August-Universität Göttingen
- Humboldt-Universität zu Berlin
- Justus Liebig University Giessen
- Karlsruhe Institute of Technology
- Leibniz Universität Hannover
- Martin Luther University Halle-Wittenberg
- Technical University of Munich
- Technische Universität Berlin
- University of Bayreuth
- University of Bonn
- University of Greifswald
- University of Hohenheim
- University of Kassel
- University of Kiel
- University of Koblenz-Landau
- University of Potsdam
- University of Rostock

NON-UNIVERSITY RESEARCH INSTITUTIONS (SELECTED)

- Federal Research Institute for Animal Health, Friedrich-Loeffler-Institut
- Forschungszentrum Jülich
- Georg Eckert Institute for International Textbook Research
- German Research Centre for Geosciences
- German Research Institute for Public Administration
- Helmholtz-Centre for Environmental Research
- Johann Heinrich von Thünen Institute
- Julius Kühn Institute
- Landesforschungsanstalt für Landwirtschaft und Fischerei Mecklenburg-Vorpommern

and 39 Leibniz institutes, in 4 Leibniz Research Alliances

OTHER GOVERNMENTAL AND NON-GOVERNMENTAL INSTITUTIONS (SELECTED)

- City of Jena

- Deutscher Wetterdienst
- Federal Institute for Geosciences and Natural Resources
- Federal Research Centre for Forestry and Forest Products
- German Federal Institute of Hydrology
- Landesamt für Geowissenschaften und Rohstoffe Brandenburg
- Landesamt für Ländliche Entwicklung, Landwirtschaft und Flurneuordnung Brandenburg
- Landesamt für Umwelt, Gesundheit und Verbraucherschutz Brandenburg
- Landeskompetenzzentrum Forst Eberswalde
- Landwirtschaftskammer Niedersachsen
- Landwirtschaftskammer Nordrhein-Westfalen
- Marktgesellschaft mbH der Naturland Betriebe
- Michael Succow Foundation,
- Nieklitzer Ökologie- und Ökotechnologie-Foundation
- The German Farmers' Association

INTERNATIONAL

UNIVERSITIES

- Aarhus University, Denmark
- Catholic University Louvain, Belgium
- Federal University of Applied Sciences, Brazil
- Federal University of Goiás, Brazil
- Free University Amsterdam, Netherlands
- Ghent University, Belgium
- Scotland's Rural College, United Kingdom
- Sokoine University of Agriculture, Tanzania
- Swedish University of Agricultural Sciences, Sweden
- Tokyo University of Agriculture and Technology, Japan
- Universidad Nacional de La Pampa Santa Rosa, La Pampa, Argentina
- Universität Zürich, Switzerland
- University Lund, Sweden
- University of Florida, USA
- University of Sassari, Italy

- University of South Bohemia Ceske Budejovice, Czech Republic
- University Twente, Netherlands
- Wageningen University, Netherlands
- Warsaw University of Life Sciences, Poland
- Zachodniopomorski Uniwersytet Technologiczny w Szczecinie, Poland

NON-UNIVERSITY RESEARCH INSTITUTIONS

- Academy of Sciences of the Czech Republic, Czech Republic
- Academy of Sciences of the Republic of Tajikistan, Tajikistan
- Brazilian Agricultural Research Corporation Brasilia, Brazil
- Brazilian Bioethanol Science and Technology Laboratory, Brazil
- Centre for study of Global Climate Change Impact, Czech Republic
- D.N.Pryanishnikov All-Russia Research and Development Institute of Agrochemistry, Russia

- Finnish Environment Institute, Finland
- International Food Policy Research Institute (IFPRI), USA
- Institute of Hydrology and Geoecology named after U.M. Akhmedsafin, Kazakhstan
- International Water Management Institute, Central Asia, Uzbekistan
- National Institute for Agricultural Research Paris, France
- Natural Resources Institute Finland, Finland
- Norwegian Agricultural Economics Research Institute, Norway
- Rufus Giwa Polytechnic Owo, Nigeria
- Swiss Federal Institute for Forest, Snow and Landscape Research
- Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Uzbekistan
- U.U.Uspanov Kazakh Research Institute of Soil Science and Agrochemistry, Kazakhstan

TEACHING

BRANDENBURG UNIVERSITY OF TECHNOLOGY COTTBUS-SENFTENBERG
- Agrarökologie
  Lecture, SS 2017
- Nachhaltige Waldbewirtschaftung
  Lecture, SS 2017

CHRISTIAN-ALBRECHTS-UNIVERSITÄT ZU KIEL
- Strategien zum nachhaltigen Boden-
  und Umwelt- management
  Lecture, SS 2017

FREIE UNIVERSITÄT BERLIN
- Zur Quartär- und Hydrogeologie Brandenburgs
  und Westpolens
  Seminar, SS 2017
- Landschaftswasserhaushalt von Berlin
  und Brandenburg
  Lecture, WS 2017 / 2018

EBERSWALDE UNIVERSITY FOR SUSTAINABLE DEVELOPMENT
- Pflanzenlehre im ökologischen Landbau
  Lecture, WS 2017 / 2018
- Grundlagen und Instrumente der Regionalentwicklung
  Lecture, WS 2017 / 2018
- Bodenkunde: Geländeübung
  Seminar, WS 2017/ 2018
- Bodenlandschaft und Stoffhaushalt
  Seminar, SS 2017
- Volkswirtschaftslehre, Kurs Landschaftsnutzung
  und Naturschutz
  Lecture, WS 2017 / 2018
- Volkswirtschaftslehre, Kurs Ökolandbau
  und Vermarktung
  Lecture, WS 2017 / 2018
- Standortlehre
  Lecture WS 2017 / 2018
- Regionales Stoffstrommanagement und
  Kreislaufwirtschaft
  Lecture, SS 2017

HUMBOLDT-UNIVERSITÄT ZU BERLIN
- Modellierung pflanzlicher Systeme
  Seminar, WS 2017 / 2018
- Land- and Water Management, Part Landmanagement
  Seminar, SS 2017
- Forschungsmethoden im Pflanzenbau
  Seminar, SS 2017
- Multifunctional Agricultural Land Use
  Lecture and Seminar, WS 2017 / 2018

LEIBNIZ UNIVERSITÄT HANNOVER
- Naturschutz- und Umweltökonomie
  Lecture and Seminar, SS 2017

MARTIN LUTHER UNIVERSITÄT HALLE-WITTENBERG
- Ressourcenmanagement und Ressourcenschutz
  Lecture, SS 2017

TECHNISCHE UNIVERSITÄT BERLIN
- Bodenmesstechnik
  Lecture, SS 2017

UNIVERSITY OF POTSDAM
- Einführung in die Hydrochemie
  Lecture, WS 2017 / 2018
- Biogeochemie
  Lecture, SS 2017
- Geoökologisches Landschaftspraktikum
  Seminar, SS 2017
- Bodenlandschaften
  Lecture, WS 2017 / 2018
- Landschaftspraktikum »Bodenlandschaftsanalyse
  in der Uckermark«
  Seminar, SS 2017
- Humangeographisches und fachdidaktisches
  Doktorandenseminar
  Seminar, SS 2017
- Regionalentwicklung und Landschaftswandel in Europa
  Seminar, SS 2017
- Angewandte Mathematik und Statistik für Ökologen
  Lecture, WS 2017 / 2018
- Zeitreihenanalyse und Spektralanalyse für Ökologen
  Lecture und Seminar, WS 2017 / 2018
- Botanische Geländeübungen
  Seminar, SS 2017

UNIVERSITÄT ROSTOCK
- Umweltökonomie
  Lecture, SS 2017

OFFICES & TASKS (SELECTED)

Augustin, Jürgen
- Editorial board member at Emission Factor Database of TFI (IPCC)

Bachinger, Johann
- Mitgl. im wiss. Beirat des Biosphärenreservates Spreewald
- Mitglied der Expertenrunde für Forschung und Züchtung des Demeter e. V.
- Vertreter des ZALF in der AG Ökologischer Landbau (Senat der Bundesforschungseinrichtungen)

Berger, Gert
- Mitglied der AG Pflanzenschutz und Biodiversität (Bundesanstalt für Landwirtschaft und Ernährung)
- Mitglied im Fachbeirat Naturhaushalt und Nachhaltiger Pflanzenbau (BVL)

Dalchow, Claus
- Editorial advisory board member at Landscape Online

Eulenstein, Frank
- Sprecher der AGs Nachwachsende Rohstoffe und Nährstoff-Effizienz im Pflanzenbau (DWA)
- Beiratsmitglied der Gemeinnützigen Landbauforschungsgesellschaft Sottorf mbh

Ewert, Frank
- Jury-Mitglied im Expertenbeirat Agrarsysteme der Zukunft (BMBF)
- Experte in working group Bio-basierte Wertschöpfungsketten (BMBF)
- Mitglied der Leitungsgruppe Forschung (BMEL)
- Scientific advisory board member der Joint Programming Initiative on Agriculture, Food Security and Climate Change (FACCE-JPI, EU)
- Gutachter zur Forschungsförderung (BMBF), zum Förderprogramm des Leibniz-Wettbewerbs (SAW) und zum Themengebiet Umwelt (Stiftung Mercator Schweiz)
- Assessment panel member beim Biotechnology and Biological Sciences Research Council, UK
- Co-leader of wheat modelling team Agricultural Model Intercomparison and Improvement Project (AgMIP)
- Co-chair at expert working group on plant modelling (Wheat Initiative)
- Editorial board member at Agriculture, Ecosystems & Environment / Field Crops Research / Nature Scientific Reports / European Journal of Agronomy

Gaasch, Nadin
- Mitglied der Landesarbeitsgruppe Berlin / Brandenburg / Mecklenburg-Vorpommern (ARL)

Gerke, Horst
- Vice-chair at Soil Systems Science Division, Subdivision Soil Physics (EGU)
- Co-editor at Journal of hydrology and Hydromechanics

Hagemann, Ulrike
- Stellv. Vorsitzende der AG Bodengase (DBG)
- Guest associate editor at Journal of Plant Nutrition and Soil Science

Heinrich, Uwe
- Vertreter des ZALF in der AG Geoinformation (BMEL)
- Vertreter des ZALF im Verband der Geoinformations-wirtschaft Berlin / Brandenburg
- Vertreter des ZALF zum Klimanavigator des Climate Service Center (Helmholtz-Zentrum Geesthacht)

Helming, Katharina
- Gutachterin für Horizon 2020 (EU)
- Editorial board member at Agronomy for Sustainable Development / Journal of Soil and Water Conservation / Land

Hierold, Wilfried
- Mitglied im Naturschutzbeirat des Landkreises Barnim

Kächele, Harald
- Präsidiumsmitglied des Global Nature Fund
- Stellvertretender Vorsitzender im Naturschutzbeirat des Landes Brandenburg (MLUL Brandenburg)
- Vorsitzender der Deutschen Umwelthilfe e. V.
- Beiratsmitglied der Berliner Stadtreinigungsbetriebe
- Stiftungsratsmitglied der Stiftung Lebendige Stadt
- Stiftungsratsvorsitzender der Tropenwaldstiftung Oro Verde

Kaiser, David B.
- Mitglied im Normenausschuss Wasserwesen 119, AK Bioverfügbarkeit (DIN)

Kalettka, Thomas
- Präsidiumsmitglied im European Pond Conservation Network
- Mitglied der AG Gewässerschutz und Pflanzenschutz (Forum zum Nationalen Aktionsplan Pflanzenschutz)
- Beiratsmitglied im F+E-Vorhaben Umsetzung des Nationalen Aktionsplans zu nachhaltigen Anwendung von Pestiziden, AG Gewässerschutz und Pflanzenschutz (UBA)

Kersebaum, Kurt-Christian
- Delegate at management committee und working-group head at COST ES1106, Assessment of European Agriculture Water Use and Trade under Climate Change (EU / ESF / COST)
- Associate editor at International Journal of Biometeorology / Field Crops Research

Lana, Marcos
- Founding member of Agroecology Europe
- Member und representative für Deutschland at der Latin-American and Caribbean Scientific Society of Agroecology

Lischeid, Gunnar
- Sprecher der Expertengruppe Umwelt-System-Theorien der Allianz-AG Infrastrukturen in der terrestrischen Forschung (DFG u. a.)

Matzdorf, Bettina
- Beiratsmitglieder at SÖF-Nachwuchsforschergruppe PlanSmart
- Beiratsmitglied der Innovationsgruppe Ginkoo

Mirschel, Wilfried
- Editorial board member at European Agrophysical Journal

Müller, Klaus
- Referee at GAIA / Ecology and Society / Konjunkturpolitik / Jahrbuch für Regionalwissenschaften
- Gutachter beim Schweizerischer Nationalfonds
- Sachverständiger in der Enquetekommission 6 / 1 Zukunft der ländlichen Regionen vor dem hintergrund des demografischen Wandels (SPD-Landtagsfraktion Brandenburg)
- Mitglied im Ausschuss Siedlungsstruktur / Natur und Umwelt der Planungsgemeinschaft Oderland-Spree
- Vors. des Naturpark-Kuratoriums Märkische Schweiz

Nendel, Claas
- Guest editor at Regional Environmental Change / Agricultural Systems
- Editorial board member at European Journal of Agronomy

Pickert, Jürgen
- Mitglied der AG Grünland Definition und Klassifizierung (European Grassland Federation)
- Mitglied der Steuerungsgruppe Grünland der Deutschen Agrarforschungs Allianz
- Mitgl. des Ausschusses für Grünland und Futterbau (DLG)
- Vorstandsmitglied des Deutschen Maiskomitees
- Redaktionsbeirat at Mais (Deutsches Maiskomitee)
- Vorstandsmitglied des Paulinenauer AK Grünland und Futterwirtschaft e. V.

Piorr, Annette
- Gutachterin des schwedischen Forschungsförderungsprogramms FORMAS, Panel Use of Natural Resources (Swedish National Research Council)
- Gutachterin für die EU

Sieber, Stefan
- Editorial board member at Food Security

Siebert, Rosemarie
- Gutachterin für das BMBF
- Mitglied der ARL
- Referee for Sociologia Ruralis / Land Use Policy
- Gutachterin at der Wissenschaftlichen Kommission Niedersachsen

Strauß, Christian
- Gutachter für BMBF, EU, COST
- Geschäftsführer der Landesarbeitsgemeinschaft Berlin / Brandenburg / Mecklenburg-Vorpommern der ARL
- Sprecher der Regionalgruppe Berlin-Brandenburg der Vereinigung für Stadt-, Regional- und Landesplanung
- Mitglied der AG Wasser bewegt Berlin (Stiftung Zukunft Berlin)
- Referee for Environment, Development and Sustainability

Ulrich, Andreas
- Editorial board member at European Journal of Soil Biology
- Beauftragter für biologische Sicherheit im Länderinstitut für Bienenkunde, hohen Neuendorf

Walther, Doreen
- Mitglied im Bundesfachausschuss des Naturschutzbunds Deutschland
- Stellv. Leiterin des AK Deutscher Dipterologen
- Vorstandsmitglied der Deutschen Gesellschaft für Medizinische Entomologie und Acarologie
- Editorial board member at Studia dipterologica
- Koordinatorin für Europa im Forschungsnetzwerk Simuliidae

Weith, Thomas
- Sprecher der ARL-Landesarbeitsgemeinschaft Berlin / Brandenburg / Mecklenburg-Vorpommern
- Mitglied der international expert group Habitat III (International Society for City and Regional Planners)
- Editorial board member at Zeitschrift für Evaluation

Wieland, Ralf
- Beiratsmitglied der FG Simulation in Umwelt und Geo-wissenschaften, Medizin und Biologie der AG Simulation (Gesellschaft für Informatik)

Willms, Matthias
- Referee for Journal of Plant Nutrition and Soil Science

Wulf, Monika
- Associate editor at Applied Vegetation Science / Journal of Vegetation Science
- Mitglied im Fachkollegium Ökologie der Agrarlandschaften (DFG)

Wurbs, Angelika
- 2. Sprecherin des AK Europa (Leibniz-Gemeinschaft)

Zander, Peter
- Editorial board member at Agricultural Systems

Zasada, Ingo
- Editorial board member at Land Use Policy

PEER-REVIEWED JOURNAL ARTICLES

Abd_Allah, E. F., Hashem, A., Alqarawi, A. A., **Wirth, S.**, **Egamberdieva, D.** (2017) Calcium application enhances growth and alleviates the damaging effects induced by Cd stress in sesame (Sesamum indicum L.). Journal of Plant Interactions 12, 1, 237–243.

Ahmad, P., Ahanger, M. A., Alyemeni, M. N., Wijaya, L., **Egamberdieva, D.**, Bhardwaj, R., Ashraf, M. (2017) Zinc application mitigates the adverse effects of NaCl stress on mustard [Brassica juncea (L.) Czern & Coss] through modulating compatible organic solutes, antioxidant enzymes, and flavonoid content. Journal of Plant Interactions 12, 1, 429–437.

Albert, C., Neßhöver, C., Schröter, M., Wittmer, H., Bonn, A., **Burkhard, B.**, Dauber, J., Döring, R., Fürst, C., Grunewald, K., Haase, D., Hansjürgens, B., Hauck, J., Hinzmann, M., Koellner, T., Plieninger, T., Rabe, S.-E., Ring, I., Spangenberg, J. H., **Stachow, U.**, Wüstemann, H., Görg, C. (2017) Towards a National Ecosystem Assessment in Germany: a plea for a comprehensive approach. GAIA 26, 1, 27–33.

Albert, C., Schröter-Schlaack, C., Hansjürgens, B., Dehnhardt, A., Döring, R., Job, H., Köppel, J., Krätzig, S., **Matzdorf, B.**, **Reutter, M.**, Schaltegger, S., Scholz, M., Siegmund-Schultze, M., Wiggering, H., Woltering, M., Haaren, C. v. (2017) An economic perspective on land use decisions in agricultural landscapes: insights from the TEEB Germany Study. Ecosystem Services 25, 69–78.

Alwhibi Mona, S., Hashem, A., Abd_Allah, E. F., Alqarawi, A. A., Soliman, D. W. K., **Wirth, S.**, **Egamberdieva, D.** (2017) Increased resistance of drought by Trichoderma harzianum fungal treatment correlates with increased secondary metabolites and proline content. Journal of Integrative Agriculture 16, 8, 1751–1757.

Arlinghaus, R., Alós, J., Beardmore, B., **Daedlow, K.**, Dorow, M., Fujitani, M., Hühn, D., Haider, W., Hunt, L. M., Johnson, B. M., Johnston, F., Klefoth, T., Matsumura, S., Monk, C., Pagel, T., Post, J. R., Rapp, T., Riepe, C., Ward, H., Wolter, C. (2017) Understanding and managing freshwater recreational fisheries as complex adaptive social-ecological systems. Reviews in Fisheries Science & Aquaculture 25, 1, 1–41.

Arodudu, O. T., **Helming, K.**, Voinov, A., Wiggering, H. (2017) Integrating agronomic factors into energy efficiency assessment of agro-bioenergy production – A case study of ethanol and biogas production from maize feedstock. Applied Energy 198, 426–439.

Arodudu, O. T., **Helming, K.**, Wiggering, H., Voinov, A. (2017) Bioenergy from low-intensity agricultural systems: an energy efficiency analysis. Energies 10, 1, Article 29.

Arodudu, O. T., **Helming, K.**, **Wiggering, H.**, Voinov, A. (2017) Towards a more holistic sustainability assessment framework for agro-bioenergy systems - a review. Environmental Impact Assessment Review 62, 61–75.

Arshad, M., **Amjath Babu, T. S.**, Krupnik, T. J., Aravindakshan, S., **Abbas, A.**, **Kächele, H.**, **Müller, K.** (2017) Climate variability and yield risk in South Asia's rice-wheat systems: emerging evidence from Pakistan. Paddy and Water Environment 15, 2, 249–261.

Arshad, M., **Kächele, H.**, Krupnik, T. J., **Amjath Babu, T. S.**, Aravindakshan, S., **Abbas, A.**, Mehmood, Y., **Müller, K.** (2017) Climate variability, farmland value, and farmers' perceptions of climate change: implications for adaptation in rural Pakistan. International Journal of Sustainable Development & World Ecology 24, 6, 532–544.

Badenko, V. L., Topaj, A. G., Yakushev, V. V., **Mirschel, W.**, **Nendel, C.** (2017) Crop models as research and interpretative tools. Sel'skokhozjajstvennaja Biologija 52, 3, 437–445.

Barkmann, T., **Siebert, R.**, Lange, A. (2017) Land-use experts' perception of regional climate change: an empirical analysis from the North German Plain. Climatic Change 144, 2, 287–301.

Battisti, R., **Parker, P. S.**, Sentelhas, P. C., **Nendel, C.** (2017) Gauging the sources of uncertainty in soybean yield simulations using the MONICA model. Agricultural Systems 155, 9–18.

Bethwell, C., **Stachow, U.**, Lüdicke, T., Probst, R., Luthardt, V. (2017) Landnutzung in den Entwicklungszonen der Biosphärenreservate mit Fallbeispielen aus den Brandenburger Biosphärenreservaten. Natur und Landschaft 92, 12, 548–562.

Bonatti, M., Homem, L. H. I. R., **Graef, F.**, Mbwana, H. A., **Rybak, C.**, **Lana, M.**, **Sieber, S.** (2017) Social organization, constraints and opportunities for kitchen garden implementation: ScalA and ScalA-FS assessment tools in Morogoro and Dodoma, Tanzania. Food Security 9, 6, 1299–1308.

Borges, F., **Glemnitz, M.**, Schultz, A., **Stachow, U.** (2017) Assessing the habitat suitability of agricultural landscapes for characteristic breeding bird guilds using landscape metrics. Environmental Monitoring and Assessment 189, 4, Article: 166.

Brandt, K. L., **Glemnitz, M.**, Schröder, B. (2017) The impact of crop parameters and surrounding habitats on different pollinator group abundance on agricultural fields. Agriculture, Ecosystems & Environment 243, 55–66.

Brunet Navarro, P., **Jochheim, H.**, Muys, B. (2017) The effect of increasing lifespan and recycling rate on carbon storage in wood products from theoretical model to application for the European wood sector. Mitigation and Adaptation Strategies for Global Change 22, 8, 1193–1205.

Buchen, C., Well, R., Helfrich, M., Fuß, R., Kayser, M., Gensior, A., Benke, M., Flessa, H. (2017) Soil mineral N dynamics and N_2O emissions following grassland renewal. Agriculture, Ecosystems & Environment 246, 325–342.

Carauta, M., Libera, A. A. D., **Hampf, A. C.**, Chen, R. F. F., Silveira, J. M. F. J., Berger, T. (2017) On-Farm trade-offs for optimal agricultural practices in Mato Grosso, Brazil. Revista de Economia e Agronegócio 15, 3, 299–322.

Chaignaud, P., Maucourt, B., Weiman, M., Alberti, A., **Kolb, S.**, Cruveillier, S., Vuilleumier, S., Bringel, F. (2017) Genomic and transcriptomic analysis of growth-supporting dehalogenation of chlorinated methanes in Methylobacterium. Frontiers in Microbiology 8, Article 1600.

Chenu, K., Porter, J. R., Martre, P., Basso, B., Chapman, S. C., **Ewert, F.**, Bindi, M., Asseng, S. (2017) Contribution of crop models to adaptation in wheat. Trends in Plant Science 22, 6, 472–490.

De Frenne, P., Brunet, J., Cougnon, M., Decocq, G., Graae, B. J., Hagenblad, J., Hermy, M., Kolb, A., Lemke, I. H., Ma, S., Orczewska, A., Plue, J., Vranckx, G., **Wulf, M.**, Verheyen, K. (2017) Biological flora of the British Isles: Milium effusum. Journal of Ecology 105, 3, 839–858.

Delgado-Serrano, M. d. M., Mistry, J., **Matzdorf, B.**, Leclerc, G. (2017) Community-based management of environmental challenges in Latin America and the Caribbean. Ecology and Society 22, 1, Article 4.

Deng, M., Hou, M., Ohkama-Ohtsu, N., Yokoyama, T., Tanaka, H., Nakajima, K., Omata, R., **Bellingrath-Kimura, S. D.** (2017) Nitrous oxide emission from organic fertilizer and controlled release fertilizer in tea fields. Agriculture 7, 3, Article 29.

Deumlich, D., Jha, A., Kirchner, G. (2017) Comparing measurements, 7Be radiotracer technique and process-based erosion model for estimating short-term soil loss from cultivated land in Northern Germany. Soil and Water Research 12, 3, 177–186.

Dietrich, O., **Kaiser, T.** (2017) Impact of groundwater regimes on water balance components of a site with a shallow water table. Ecohydrology 10, 6, e1867.

Djumaboev, K., **Hamidov, A.**, Anarbekov, O., Gafurov, Z., Tussupova, K. (2017) Impact of institutional change on irrigation management: a case study from southern Uzbekistan. Water 9, 6, Article: 419.

Dougherty, B., Gray, M., Johnson, M. G., **Kleber, M.** (2017) Can biochar covers reduce emissions from manure lagoons while capturing nutrients? Journal of Environmental Quality 46, 3, 659–666.

Eden, M., **Gerke, H. H.**, Houot, S. (2017) Organic waste recycling in agriculture and related effects on soil water retention and plant available water: a review. Agronomy for Sustainable Development 37, 2, Article: 11.

Egamberdieva, D., Davranov, K., **Wirth, S.**, Hashem, A., Abd_Allah, E. F. (2017) Impact of soil salinity on plant-growth promoting and biological control abilities of root associated bacteria. Saudi Journal of Biological Sciences 24, 7, 1601 – 1608.

Egamberdieva, D., **Reckling, M.**, **Wirth, S.** (2017) Biochar-based Bradyrhizobium inoculum improves growth of lupin (Lupinus angustifolius L.) under drought stress. European Journal of Soil Biology 78, 38 – 42.

Egamberdieva, D., **Wirth, S.**, Alqarawi, A. A., abd_Allah, E. F., Hashem, A. (2017) Phytohormones and beneficial microbes: essential components for plants to balance stress and fitness. Frontiers in Microbiology 8, Article 2104.

Egamberdieva, D., **Wirth, S.**, **Behrendt, U.**, Ahmad, P., Berg, G. (2017) Antimicrobial activity of medicinal plants correlates with the proportion of antagonistic endophytes. Frontiers in Microbiology 8, Article 199.

Egamberdieva, D., **Wirth, S.**, **Jabborova, D.**, Räsänen, L. A., Liao, H. (2017) Coordination between Bradyrhizobium and Pseudomonas alleviates salt stress in soybean through altering root system architecture. Journal of Plant Interactions 12, 1, 100 – 107.

Egamberdieva, D., **Wirth, S.**, Li, L., Abd-Allah, E. F., Lindström, K. (2017) Microbial cooperation in the rhizosphere improves liquorice growth under salt stress. Bioengineered 8, 4, 433 – 438.

Egamberdieva, D., **Wirth, S.**, Shurigin, V. V., Hashem, A., Abd_Allah, E. F. (2017) Endophytic bacteria improve plant growth, symbiotic performance of chickpea (Cicer arietinum L.) and induce suppression root rot caused Fusarium solani under salt stress. Frontiers in Microbiology 8, Article 1887.

Ehrmann, S., Liira, J., Gärtner, S., Hansen, K., Brunet, J., Cousins, S. A. O., Deconchat, M., Decocq, G., De Frenne, P., De Smedt, P., Diekmann, M., Gallet-Moron, E., Kolb, A., Lenoir, J., Lindgren, J., **Naaf, T.**, Paal, T., Valdés, A., Verheyen, K., **Wulf, M.**, Scherer-Lorenzen, M. (2017) Environmental drivers of Ixodes ricinus abundance in forest fragments of rural European landscapes. BMC Ecology 17, Article 31.

Eulenstein, F., **Lana, M.**, Schlindwein, S. L., Sheudzhen, A., **Tauschke, M.**, **Behrendt, A.**, Guevara, E., Meira, S. (2017) Regionalization of maize responses to climate change scenarios, N use efficiency and adaptation strategies. Horticulturae 3, 1, Article 9.

Eulenstein, F., **Lana, M.**, Schlindwein, S., Sheudzhen, A., **Tauschke, M.**, **Behrendt, A.**, Guevara, E., Meira, S. (2017) Trends of soybean yields under climate change scenarios. Horticulturae 3, 1, Article 10.

Eulenstein, F., **Tauschke, M.**, **Behrendt, A.**, Monk, J., **Schindler, U.**, **Lana, M.**, Monk, S. (2017) The application of mycorrhizal fungi and organic fertilisers in horticultural potting soils to improve water use efficiency of crops. Horticulturae 3, 1, Article 8.

Eyshi Rezaei, E., Siebert, S., **Ewert, F.** (2017) Climate and management interaction cause diverse crop phenology trends. Agricultural and Forest Meteorology 233, 55 – 70.

Fiedler, S. R., **Augustin, J.**, Wrage-Mönnig, N., Jurasinski, G., **Gusovius, B.**, Glatzel, S. (2017) Potential short-term losses of N_2O and N_2 from high concentrations of biogas digestate in arable soils. SOIL 3, 3, 161 – 176.

Fischer, A., **Kaiser, T.**, **Pickert, J.**, **Behrendt, A.** (2017) Studies on drinking water intake of fallow deer, sheep and mouflon under semi-natural pasture conditions. Grassland Science 63, 1, 46 – 53.

Fleisher, D. H., Condori, B., Quiroz, R., Alva, A., Asseng, S., Barreda, C., Bindi, M., Boote, K. J., Ferrise, R., Franke, A. C., Govindakrishnan, P. M., Harahagazwe, D., Hoogenboom, G., Naresh Kumar, S., Merante, P., **Nendel, C.**, Olesen, J. E., **Parker, P. S.**, Raes, D., Raymundo, R., Ruane, A. C., Stöckle, C., Supit, I., Vanuytrecht, E., Wolf, J., Woli, P. (2017) A potato model intercomparison across varying climates and productivity levels. Global Change Biology 23, 3, 1258 – 1281.

Fox, C. A., Miller, J. J., **Joschko, M.**, Drury, C. F., Reynolds, W. (2017) Earthworm population dynamics as a consequence of long-term and recently imposed tillage in a clay loam soil. Canadian Journal of Soil Science 97, 4, 561 – 579.

Garcia Rodrigues, J., Conides, A. J., Rivero Rodriguez, S., Raicevich, S., Pita, P., Kleisner, K. M., Pita, C., Lopes, P. F. M., Alonso Roldán, V., Ramos, S. S., Klaoudatos, D., Outeiro, L., Armstrong, C., Teneva, L., Stefanski, S., Böhnke-Henrichs, A., Kruse, M., Lillebø, A. I., Bennett, E. M., Belgrano, A., Murillas, A., Sousa Pinto, I., **Burkhard, B.**, Villasante, S. (2017) Marine and coastal Cultural Ecosystem Services: knowledge gaps and research priorities. One Ecosystem 2, e12290.

Geßler, A., Roy, J., **Kayler, Z.**, Ferrio, J. P., Alday, J. G., Bahn, M., del Castillo, J., Devidal, S., García-Muñoz, S., Landais, D., Martín-Gomez, P., Milcu, A., Piel, C., **Pirhofer-Walzl, K.**, Galiano, L., Schaub, M., Haeni, M., Ravel, O., Salekin, S., Tissue, D. T., Tjoelker, M. G., Voltas, J., Hoch, G., Resco de Dios, V. (2017) Night and day - circadian regulation of night-time dark respiration and light-enhanced dark respiration in plant leaves and canopies. Environmental and Experimental Botany 137, 14 – 25.

Ghosh, R., Goyal, Y., **Rommel, J.**, Sagebiel, J. (2017) Are small firms willing to pay for improved power supply? Evidence from a contingent valuation study in India. Energy Policy 109, 659 – 665.

Gobin, A., **Kersebaum, K.-C.**, Eitzinger, J., Trnka, M., Hlavinka, P., Takáč, J., Kroes, J., Ventrella, D., Marta, A., Deelstra, J., Lalić,

B., Nejedlik, P., Orlandini, S., Peltonen-Sainio, P., Rajala, A., Saue, T., Şaylan, L., Stričevic, R., Vučetić, V., Zoumides, C. (2017) Variability in the water footprint of arable crop production across European regions. Water 9, 2, Article: 93.

Gocke, M. I., Huguet, A., Derenne, S., **Kolb, S.**, Dippold, M. A., Wiesenberg, G. L. B. (2017) Disentangling interactions between microbial communities and roots in deep subsoil. Science of the Total Environment 575, 135 – 145.

Graef, F., **Uckert, G.**, **Schindler, J.**, **König, H. J.**, Mbwana, H. A., Fasse, A., Mwinuka, L., Mahoo, H., Kaburire, L. N., Saidia, P., Yustas, Y. M., Silayo, V., Makoko, B., Kissoly, L., Lambert, C., Kimaro, A., **Sieber, S.**, **Hoffmann, H.**, Kahimba, F. C., Mutabazi, K. D. (2017) Expert-based ex-ante assessments of potential social, ecological, and economic impacts of upgrading strategies for improving food security in rural Tanzania using the ScalA-FS approach. Food Security 9, 6, 1255 – 1270.

Grosz, B., Dechow, R., Gebbert, S., Hoffmann, H., Zhao, G., Constantin, J., Raynal, H., Wallach, D., Coucheney, E., Lewan, E., Eckersten, H., **Specka, X.**, **Kersebaum, K.-C.**, **Nendel, C.**, Kuhnert, M., Yeluripati, J., Haas, E., Teixeira, E., Bindi, M., Trombi, G., Moriondo, M., Doro, L., Roggero, P. P., Zhao, Z., Wang, E., Tao, F., Rötter, R., Kassie, B., Cammarano, D., Asseng, S., Weihermüller, L., Siebert, S., Gaiser, T., **Ewert, F.** (2017) The implication of input data aggregation on up-scaling soil organic carbon changes. Environmental Modelling & Software 96, 361 – 377.

Guse, B., Pfannerstill, M., Gafurov, A., Kiesel, J., **Lehr, C.**, Fohrer, N. (2017) Identifying the connective strength between model parameters and performance criteria. Hydrology and Earth System Sciences 21, 11, 5663 – 5679.

Heggemann, T., Welp, G., Amelung, W., Angst, G., Franz, S. O., **Koszinski, S.**, Schmidt, K., Pätzold, S. (2017) Proximal gamma-ray spectrometry for site-independent in situ prediction of soil texture on ten heterogeneous fields in Germany using support vector machines. Soil & Tillage Research 168, 99 – 109.

Heitepriem, N., **Bethwell, C.**, Nowak, E., Niclas, G. (2017) Abschätzung der Repräsentativität des Netzes der deutschen UNESCO-Biosphärenreservate - ein Beitrag zur Diskussion. Natur und Landschaft 92, 12, 534 – 547.

Herbrich, M., **Gerke, H. H.** (2017) Scales of water retention dynamics observed in eroded Luvisols from arable postglacial soil landscape. Vadose Zone Journal 16, 10.

Herbrich, M., **Gerke, H. H.**, Bens, O., **Sommer, M.** (2017) Water balance and leaching of dissolved organic and inorganic carbon of eroded Luvisols using high precision weighing lysimeters. Soil & Tillage Research 165, 144 – 160.

Hermanns, T., **Helming, K.**, **König, H. J.**, Schmidt, K., **Li, Q.**, Faust, H. (2017) Sustainability impact assessment of

peatland-use scenarios: confronting land use supply with demand. Ecosystem Services 26, Part B, 365–376.

Heym, E., Kampen, H., Fahle, M., Hohenbrink, T. L., Schäfer, M., Scheuch, D. E., **Walther, D.** (2017) Anopheles plumbeus (Diptera: Culicidae) in Germany: updated geographic distribution and public health impact of a nuisance and vector mosquito. Tropical Medicine and International Health 22, 1, 103–112.

Heym, E., Schröder, J., Kampen, H., **Walther, D.** (2017) The nuisance mosquito Anopheles plumbeus (Stephens, 1828) in Germany - a questionnaire survey may help support surveillance and control. Frontiers in Public Health 5, Article 278.

Hildebrand, S., **Schuler, J.**, Steinhäußer, R., Krämer, C. (2017) Berücksichtigung kumulativer Wirkungen in der Umweltplanung. Natur und Landschaft 92, 5, 209–213.

Hjelkrem, A.-G. R., Höglind, M., van Oijen, M., Schellberg, J., Gaiser, T., **Ewert, F.** (2017) Sensitivity analysis and Bayesian calibration for testing robustness of the BASGRA model in different environments. Ecological Modelling 359, 80–91.

Hoffmann, H., Baranowski, P., Krzyszczak, J., Zubik, M., Sławiński, C., Gaiser, T., **Ewert, F.** (2017) Temporal properties of spatially aggregated meteorological time series. Agricultural and Forest Meteorology 234–235, 247–257.

Hoffmann, H., Sander, K., Brüntrup, M., **Sieber, S.** (2017) Applying the Water-Energy-Food nexus to the charcoal value chain. Frontiers in Environmental Science 5, Article 84.

Hoffmann, M., **Jurisch, N.**, **Garcia Alba, D. J.**, **Albiac Borraz, E.**, **Schmidt, M.**, **Huth, V.**, **Rogasik, H.**, **Rieckh, H.**, **Verch, G.**, **Sommer, M.**, **Augustin, J.** (2017) Detecting small-scale spatial heterogeneity and temporal dynamics of soil organic carbon (SOC) stocks: a comparison between automatic chamber-derived C budgets and repeated soil inventories. Biogeosciences 14, 4, 1003–1019.

Hoffmann, M., **Schulz-Hanke, M. V.**, **Garcia Alba, D. J.**, **Jurisch, N.**, **Hagemann, U.**, Sachs, T., **Sommer, M.**, **Augustin, J.** (2017) A simple calculation algorithm to separate high-resolution CH4 flux measurements into ebullition- and diffusion-derived components. Atmospheric Measurement Techniques 10, 1, 109–118.

Huth, V., **Vaidya, S.**, **Hoffmann, M.**, **Jurisch, N.**, Günther, A., **Gundlach, L.**, **Hagemann, U.**, Elsgaard, L., **Augustin, J.** (2017) Divergent NEE balances from manual-chamber CO₂ fluxes linked to different measurement and gap-filling strategies: a source for uncertainty of estimated terrestrial C sources and sinks? Journal of Plant Nutrition and Soil Science 180, 3, 302–315.

Inostroza, L., **König, H. J.**, Pickard, B., Zhen, L. (2017) Putting ecosystem services into practice: Trade-off assessment tools, indicators and decision support systems (Editorial). Ecosystem Services 26, Part B, 303–305.

Iovino, M., Angulo-Jaramillo, R., Bagarello, V., **Gerke, H. H.**, Jabro, J., Lassabatere, L. (2017) Thematic issue on soil water infiltration. Journal of Hydrology and Hydromechanics 65, 3, 205–208.

Iturri, L. A., **Funk, R.**, **Leue, M.**, **Sommer, M.**, Buschiazzo, D. E. (2017) Wind sorting affects differently the organo-mineral composition of saltating and particulate materials in contrasting texture agricultural soils. Aeolian Research 28, 39–49.

Junker, L. V., Kleiber, A., **Jansen, K.**, Wildhagen, H., Hess, M., **Kayler, Z.**, Kammerer, B., Schnitzler, J.-P., Kreuzwieser, J., **Geßler, A.**, Ensminger, I. (2017) Variation in short-term and long-term responses of photosynthesis and isoprenoid-mediated photoprotection to soil water availability in four Douglas-fir provenances. Scientific Reports 7, Article number: 40145.

Kaiser, D. B., **Gaasch, N.**, **Weith, T.** (2017) Co-production of knowledge: a conceptual approach for integrative knowledge management in planning. Transactions of the Association of European Schools of Planning 1, 1, 18–32.

Kaiser, T., **Fischer, A.** (2017) Suitability of two sheep landraces (Skudde and Bentheimer Landschaf) for extensive farming on fen grasslands. Grassland Science 63, 4, 225–235.

Kalinkat, G., Cabral, J. S., Darwall, W., Ficetola, G. F., Fisher, J. L., Giling, D. P., Gosselin, M.-P., Grossart, H.-P., Jähnig, S. C., Jeschke, J. M., Knopf, K., Larsen, S., **Onandia, G.**, **Pätzig, M.**, Saul, W.-C., Singer, G., Sperfeld, E., Jarić, I. (2017) Flagship umbrella species needed for the conservation of overlooked aquatic biodiversity. Conservation Biology 31, 2, 481–485.

Kameke, D., Kampen, H., **Walther, D.** (2017) Activity of Culicoides spp. (Diptera: Ceratopogonidae) inside and outside of livestock stables in late winter and spring. Parasitology Research 116, 3, 881–889.

Kampen, H., Schuhbauer, A., **Walther, D.** (2017) Emerging mosquito species in Germany - a synopsis after 6 years of mosquito monitoring (2011–2016). Parasitology Research 116, 12, 3253–3263.

Kasymov, U., **Hamidov, A.** (2017) Comparative analysis of nature-related transactions and governance structures in pasture use and irrigation water in Central Asia. Sustainability 9, 9, Article: 1633.

Kayler, Z., Keitel, C., **Jansen, K.**, **Geßler, A.** (2017) Experimental evidence of two mechanisms coupling leaf-level C assimilation to rhizosphere CO₂ release. Environmental and Experimental Botany 135, 21–26.

Keiluweit, M., Wanzek, T., **Kleber, M.**, Nico, P., Fendorf, S. (2017) Anaerobic microsites have an unaccounted role in soil carbon stabilization. Nature Communications 8, Article number: 1771.

Kernecker, M. L., Vogl, C. R., Aguilar Meléndez, A. (2017) Women's local knowledge of water resources and adaptation to landscape change in the mountains of Veracruz, Mexico. Ecology and Society 22, 4, Article 37.

Klaus, C., Conraths, F. J., Schares, G., Kampen, H., **Walther, D.**, Daugschies, A. (2017) Vernachlässigte, neue und wiederkehrende Parasitosen in Deutschland - bedeutend für die Großtierpraxis? Tierärztliche Praxis: Ausgabe G, Großtiere, Nutztiere 45, 6, 377–389.

Knierim, A., Labarthe, P., Laurent, C., Prager, K., Kania, J., Madureira, L., **Ndah, H. T.** (2017) Pluralism of agricultural advisory service providers - facts and insights from Europe. Journal of Rural Studies 55, 45–58.

Kojima, K., Ookawa, T., Yamaya-Ito, H., Salem, D., Ohkama-Ohtsu, N., **Bellingrath-Kimura, S. D.**, Yokoyama, T. (2017) Characterization of 140 Japanese and world rice collections cultivated in Nihonmatsu-city in Fukushima in terms of radiocesium activity concentrations in seed grains and straws to explore rice cultivars with low radiocesium accumulation. Journal of Radioanalytical and Nuclear Chemistry 314, 2, 1009–1021.

Kolb, S., Horn, M. A., Murrell, J. C., Knief, C. (2017) The impact of microorganisms on consumption of atmospheric trace gases (Editorial). Frontiers in Microbiology 8, Article 1856.

Kolk, J., **Naaf, T.**, **Wulf, M.** (2017) Paying the colonization credit: converging plant species richness in ancient and post-agricultural forests in NE Germany over five decades. Biodiversity and Conservation 26, 3, 735–755.

König, H. J., **Graef, F.**, Schindler, J., Fasse, A., Mutabazi, K. D., Lambert, C., Ngwenya, P., **Uckert, G.**, Mahoo, H., Hattermann, F. F., **Sieber, S.** (2017) Combining participatory, qualitative and quantitative methods for impact assessment of food value chains into an integrated framework. Food Security 9, 6, 1309–1321.

Krause, M., Nkonya, E., Griess, V. C. (2017) An economic valuation of ecosystem services based on perceptions of rural Ethiopian communities. Ecosystem Services 26, Part A, 37–44.

Kuhlisch, C., Kampen, H., **Walther, D.** (2017) Two new distribution records of Aedes (Rusticoidus) refiki Medschid, 1928 (Diptera: Culicidae) from Germany. Journal of the European Mosquito Control Association 35, 18–24.

Kuhnert, M., Yeluripati, J., Smith, P., Hoffmann, H., van Oijen, M., Constantin, J., Coucheney, E., Dechow, R., Eckersten, H., Gaiser, T., Grosz, B., Haas, E., **Kersebaum, K.-C.**, Kiese, R., Klatt, S., Lewan, E., **Nendel, C.**, Raynal, H., Sosa, C., **Specka, X.**, Teixeira, E., Wang, E., Weihermüller, L., Zhao, G., Zhao, Z., Ogle, S., **Ewert, F.** (2017) Impact analysis of climate data aggregation at different spatial scales on simulated net primary productivity for croplands. European Journal of Agronomy 88, 41–52.

Lana, M. A., **Eulenstein, F.**, Schlindwein, S. L., **Graef, F.**, **Sieber, S.**, Bittencourt, H. v. H. (2017) Yield stability and lower

susceptibility to abiotic stresses of improved open-pollinated and hybrid maize cultivars. Agronomy for Sustainable Development 37, 4, Article Number: 30.

Lehr, C., **Rauneker, P.**, **Fahle, M.**, **Hohenbrink, T.**, **Böttcher, S.**, Natkhin, M., Thomas, R., **Dannowski, R.**, **Schwien, B.**, **Lischeid, G.** (2017) Communicating landscape hydrology - the water cycle in a box. Hydrological Processes 31, 3, 750–752.

Leue, M., Eckhardt, K.-U., **Gerke, H. H.**, **Ellerbrock, R. H.**, Leinweber, P. (2017) Spatial distribution of organic matter compounds at intact macropore surfaces predicted by DRIFT spectroscopy. Vadose Zone Journal 16, 9.

Lischeid, G., **Balla, D.**, **Dannowski, R.**, **Dietrich, O.**, **Kalettka, T.**, **Merz, C.**, **Schindler, U.**, **Steidl, J.** (2017) Forensic hydrology: what function tells about structure in complex settings. Environmental Earth Sciences 76, 1, Article: 40.

Liu, Z., **Rommel, J.**, Feng, S., Hanisch, M. (2017) Can land transfer through land cooperatives foster off-farm employment in China? China Economic Review 45, 35–44.

Loft, L., Le, D. N., Pham, T. T., Yang, A. L., Tjajadi, J. S., Wong, G. Y. (2017) Whose equity matters? National to local equity perceptions in Vietnam's payments for forest ecosystem services scheme. Ecological Economics 135, 164–175.

Loft, L., Pham, T. T., Wong, G. Y., Brockhaus, M., Le, D. N., Tjajadi, J. S., Luttrell, C. (2017) Risks to REDD+: potential pitfalls for policy design and implementation. Environmental Conservation 44, 1, 44–55.

Löhr, K., **Graef, F.**, **Bonatti, M.**, Mahoo, H. F., Wambura, J., **Sieber, S.** (2017) Conflict management systems for large scientific research projects. International Journal of Conflict Management 28, 3, 322–345.

Löhr, K., Hochmuth, C., **Graef, F.**, **Wambura, J.**, **Sieber, S.** (2017) Conflict management programs in trans-disciplinary research projects: the case of a food security project in Tanzania. Food Security 9, 6, 1189–1201.

Lorenz, S., Rasmussen, J. J., Süß, A., **Kalettka, T.**, Golla, B., Horney, P., Stähler, M., Hommel, B., Schäfer, R. B. (2017) Specifics and challenges of assessing exposure and effects of pesticides in small water bodies. Hydrobiologia 793, 1, 213–224.

Lorn, V., Tanaka, H., **Bellingrath-Kimura, S. D.**, Oikawa, Y. (2017) Effects of biochar from rice husk and Chromolaena odorata on soil properties and tomato growth in Cambodia. Tropical Agriculture and Development 61, 1, 99–106.

Maaßen, S., Richter, E., Coors, A., Guimarães, B., **Balla, D.** (2017) Dissipation of micropollutants in a rewetted fen peatland: a field study using treated wastewater. Water 9, 6, Article: 449.

Mahrookashani, A., Siebert, S., Hüging, H., **Ewert, F.** (2017) Independent and combined effects of high temperature and

drought stress around anthesis on wheat. Journal of Agronomy and Crop Science 203, 6, 453–463.

Maiorano, A., Martre, P., Asseng, S., **Ewert, F.**, Müller, C., Rötter, R. P., Ruane, A. C., Semenov, M. A., Wallach, D., Wang, E., Alderman, P. D., Kassie, B. T., Biernath, C., Basso, B., Cammarano, D., Challinor, A. J., Doltra, J., Dumont, B., Rezaei, E. E., Gayler, S., **Kersebaum, K.-C.**, Kimball, B. A., Koehler, A.-K., Liu, B., O'Leary, G. J., Olesen, J. E., Ottman, M. J., Priesack, E., Reynolds, M., Stratonovitch, P., Streck, T., Thorburn, P. J., Waha, K., Wall, G. W., White, J. W., Zhao, Z., Zhu, Y. (2017) Crop model improvement reduces the uncertainty of the response to temperature of multi-model ensembles. Field Crops Research 202, 5–20.

Malone, R. W., **Kersebaum, K.-C.**, Kaspar, T. C., Ma, L., Jaynes, D. B., Gillette, K. (2017) Winter rye as a cover crop reduces nitrate loss to subsurface drainage as simulated by HERMES. Agricultural Water Management 184, 156–169.

Martinez, G., Brocca, L., **Gerke, H. H.**, Pachepsky, Y. A. (2017) Soil variability and biogeochemical fluxes: toward a better understanding of soil processes at the land surface. Vadose Zone Journal 16, 10.

Martre, P., Reynolds, M. P., Asseng, S., **Ewert, F.**, Alderman, P. D., Cammarano, D., Maiorano, A., Ruane, A. C., Aggarwal, P. K., Anothai, J., Basso, B., Biernath, C., Challinor, A. J., De Sanctis, G., Doltra, J., Dumont, B., Fereres, E., Garcia-Vila, M., Gayler, S., Hoogenboom, G., Hunt, L. A., Izaurralde, R. C., Jabloun, M., Jones, C. D., Kassie, B. T., **Kersebaum, K.-C.**, Koehler, A.-K., Müller, C., Naresh Kumar, S., Liu, B., Lobell, D. B., **Nendel, C.**, O'Leary, G., Olesen, J. E., Palosuo, T., Priesack, E., Rezaei, E. E., Ripoche, D., Rötter, R. P., Semenov, M. A., Stöckle, C., Stratonovitch, P., Streck, T., Supit, I., Tao, F., Thorburn, P., Waha, K., Wang, E., White, J. W., Wolf, J., Zhao, Z., Zhu, Y. (2017) The International Heat Stress Genotype Experiment for modeling wheat response to heat: field experiments and AgMIP-Wheat multi-model simulations. Open Data Journal for Agricultural Research 3, 23–28.

Martre, P., Yin, X., **Ewert, F.** (2017) Modeling crops from genotype to phenotype in a changing climate. Field Crops Research 202, 1–4.

Matthé, M., Sannolo, M., Winiarski, K., Spitzen-van der Sluijs, A., Goedbloed, D., Steinfartz, S., **Stachow, U.** (2017) Comparison of photo-matching algorithms commonly used for photographic capture–recapture studies. Ecology and Evolution 7, 15, 5861–5872.

Mehmood, Y., Rong, K., **Arshad, M.**, Bashir, M. K. (2017) Do liquidity constraints influence the technical efficiency of wheat growers? Evidence from Punjab, Pakistan. The Journal of Animal & Plant Sciences 27, 2, 667–679.

Milcu, A., **Geßler, A.**, Roscher, C., Rose, L., **Kayler, Z.**, Bachmann, D., **Pirhofer-Walzl, K.**, Zavadlav, S., Galiano, L., Buchmann, T., Scherer-Lorenzen, M., Roy, J. (2017) Top canopy nitrogen allocation linked to

increased grassland carbon uptake in stands of varying species richness. Scientific Reports 7, 1, Article number: 8392.

Mirzaei, A., **Knierim, A.**, Fealy Nahavand, S., Mahmoudi, H. (2017) Gap analysis of water governance in Northern Iran: a closer look into the water reservoirs. Environmental Science & Policy 77, 98–106.

Mnimbo, T. S., Lyimo-Macha, J., Urassa, J. K., Mahoo, H. F., Tumbo, S. D., **Graef, F.** (2017) Influence of gender on roles, choices of crop types and value chain upgrading strategies in semi-arid and sub-humid Tanzania. Food Security 9, 6, 1173–1187.

Mnimbo, T. S., Lyimo-Macha, J., Urassa, J., **Graef, F.** (2017) Gendered impact assessment on food securing upgrading strategies: results from three methodological approaches. Developing Country Studies 7, 2, 94–112.

Monaco, F., **Zasada, I.**, Wascher, D., Glavan, M., Pintar, M., Schmutz, U., Mazzocchi, C., Corsi, S., Sali, G. (2017) Food production and consumption: city regions between localism, agricultural land displacement, and economic competitiveness. Sustainability 9, 1, Article: 96.

Morawe, M., Hoeke, H., Wissenbach, D., Lentendu, G., Wubet, T., **Kröber, E.**, **Kolb, S.** (2017) Acidotolerant Bacteria and fungi as a sink of methanol-derived carbon in a deciduous forest soil. Frontiers in Microbiology 8, Article 1361.

Mrak, T., **Kühdorf, K.**, Grebenc, T., Štraus, I., **Münzenberger, B.**, Kraigher, H. (2017) Scleroderma areolatum ectomycorrhiza on Fagus sylvatica L. Mycorrhiza 27, 3, 283–293.

Mukul, S. A., Sohel, M. S. I., Herbohn, J., Inostroza, L., **König, H. J.** (2017) Integrating ecosystem services supply potential from future land-use scenarios in protected area management: a Bangladesh case study. Ecosystem Services 26, Part B, 355–364.

Mwinuka, L., Mutabazi, K. D., **Graef, F.**, **Sieber, S.**, Makindara, J., Kimaro, A., **Uckert, G.** (2017) Simulated willingness of farmers to adopt fertilizer micro-dosing and rainwater harvesting technologies in semi-arid and sub-humid farming systems in Tanzania. Food Security 9, 6, 1237–1253.

Mwinuka, L., Mutabazi, K. D., **Sieber, S.**, Makindara, J., Bizimana, J.-C. (2017) An economic risk analysis of fertiliser microdosing and rainwater harvesting in a semi-arid farming system in Tanzania. Agrekon 56, 3, 274–289.

Nautiyal, S., **Kächele, H.**, Umesh Babu, M. S., Tikhile, P., Baksi, S. (2017) Land-use change in Indian tropical agro-ecosystems: eco-energy estimation for socio-ecological sustainability. Environmental Monitoring and Assessment 189, 4, Article: 168.

Nerger, R., **Funk, R.**, Cordsen, E., Fohrer, N. (2017) Application of a modeling approach to designate soil and soil organic carbon loss to wind erosion on long-term monitoring sites (BDF) in Northern Germany. Aeolian Research 25, 135–147.

Niang, A., Becker, M., **Ewert, F.**, Ibnou, D., Gaiser, T., Tanaka, A., Senthilkumar, K., Rodenburg, J., Johnson, J.-M., Akakpo, C., Segda, Z., Gbakatchetche, H., Jaiteh, F., Bam, R. K., Dogbe, W., Keita, S., Kamissoko, N., Mossi, M. I., Bakaren, O. S., Cissé, M., Baggie, I., Ablede, K. A., Saito, K. (2017) Variability and determinants of yields in rice production systems of West Africa. Field Crops Research 207, 1–12.

Nikonorov, A., Terleev, V., Badenko, V., **Mirschel, W.**, Abakumov, E., Ginevsky, R., Lazarev, V., Togo, I., Volkova, Y., Melnichuk, A., Dunaieva, I., Akimov, L. (2017) Modeling the hydrophysical soil properties as a part of self-regulated flood dams projection in gis-environment for sustainable urban development. IOP Conference Series: Earth and Environmental Science 90, Article 012109.

Nitzsche, K., Kaiser, M., **Premke, K.**, **Geßler, A.**, **Ellerbrock, R. H.**, **Hoffmann, C.**, Kleeberg, A., **Kayler, Z.** (2017) Organic matter distribution and retention along transects from hilltop to kettle hole within an agricultural landscape. Biogeochemistry 136, 1, 47–70.

Nitzsche, K., **Kalettka, T.**, **Premke, K.**, **Lischeid, G.**, **Geßler, A.**, **Kayler, Z.** (2017) Land-use and hydroperiod affect kettle hole sediment carbon and nitrogen biogeochemistry. Science of the Total Environment 574, 46–56.

Oguntunde, P. G., Abiodun, B. J., **Lischeid, G.** (2017) Impacts of climate change on hydro-meteorological drought over the Volta Basin, West Africa. Global and Planetary Change 155, 121–132.

Oguntunde, P. G., **Lischeid, G.**, Abiodun, B. J., **Dietrich, O.** (2017) Analysis of long-term dry and wet conditions over Nigeria. International Journal of Climatology 37, 9, 3577–3586.

Omari, R., Sarkodee-Addo, E., Fujii, Y., Oikawa, Y., **Bellingrath-Kimura, S. D.** (2017) Impacts of fertilization type on soil microbial biomass and nutrient availability in two agroecological zones of Ghana. Agronomy 7, 3, Article: 55.

Opitz, I., **Specht, K.**, **Piorr, A.**, **Siebert, R.**, **Zasada, I.** (2017) Effects of consumer-producer interactions in alternative food networks on consumers' learning about food and agriculture. Moravian Geographical Reports 25, 3, 181–191.

Orlova, T., Melnichuk, A., Klimenko, K., Vitvitskaya, V., Popovych, V., Dunaieva, I., Terleev, V., Nikonorov, A., Togo, I., Volkova, Y., **Mirschel, W.**, Garmanov, V. (2017) Reclamation of landfills and dumps of municipal solid waste in a energy efficient waste management system: methodology and practice. IOP Conference Series: Earth and Environmental Science 90, Article 012110.

Pagani, V., **Stella, T.**, Guarneri, T., Finotto, G., van den Berg, M., Marin, F. R., Acutis, M., Confalonieri, R. (2017) Forecasting sugarcane yields using agro-climatic indicators and Canegro model: a case study in the main production region in Brazil. Agricultural Systems 154, 45–52.

Parker, P. S., Shonkwiler, J. S., Aurbacher, J. (2017) Cause and consequence in maize planting dates in Germany. Journal of Agronomy and Crop Science 203, 3, 227–240.

Peter, C., **Glemnitz, M.**, Winter, K., Kornatz, P., Müller, J., Heiermann, M., Aurbacher, J. (2017) Impact of energy crop rotation design on multiple aspects of resource efficiency. Chemical Engineering & Technology 40, 2, 323–332.

Peter, C., **Helming, K.**, **Nendel, C.** (2017) Do greenhouse gas emission calculations from energy crop cultivation reflect actual agricultural management practices? - A review of carbon footprint calculators. Renewable and Sustainable Energy Reviews 67, 461–476.

Peter, C., **Specka, X.**, Aurbacher, J., Kornatz, P., Herrmann, C., Heiermann, M., Müller, J., **Nendel, C.** (2017) The MiLA tool: modelling greenhouse gas emissions and cumulative energy demand of energy crop cultivation in rotation. Agricultural Systems 152, 67–79.

Platen, R., **Konrad, J.**, **Glemnitz, M.** (2017) Novel energy crops: an opportunity to enhance the biodiversity of arthropod assemblages in biomass feedstock cultures? International Journal of Biodiversity Science, Ecosystem Services & Management 13, 1, 162–171.

Plue, J., De Frenne, P., Acharya, K., Brunet, J., Chabrerie, O., Decocq, G., Diekmann, M., Graae, B. J., Heinken, T., Hermy, M., Kolb, A., Lemke, I., Liira, J., **Naaf, T.**, Verheyen, K., **Wulf, M.**, Cousins, S. A. O. (2017) Where does the community start, and where does it end? Including the seed bank to reassess forest herb layer responses to the environment. Journal of Vegetation Science 28, 2, 424–435.

Preißel, S., **Zander, P.**, **Knierim, A.** (2017) Sustaining farming on marginal land: farmers' convictions, motivations and strategies in northeastern Germany. Sociologia Ruralis 57, Supplement S1, 682–708.

Pribadi, D. O., **Zasada, I.**, **Müller, K.**, Pauleit, S. (2017) Multifunctional adaption of farmers as response to urban growth in the Jabodetabek Metropolitan Area, Indonesia. Journal of Rural Studies 55, 100–111.

Puppe, D., **Höhn, A.**, **Kaczorek, D.**, Wanner, M., **Wehrhan, M.**, **Sommer, M.** (2017) How big is the influence of biogenic silicon pools on short-term changes in water-soluble silicon in soils? Implications from a study of a 10-year-old soil-plant system. Biogeosciences 14, 22, 5239–5252.

Rauf, S., Bakhsh, K., **Abbas, A.**, Hassan, S., Ali, A., **Kächele, H.** (2017) How hard they hit? Perception, adaptation and public health implications of heat waves in urban and peri-urban Pakistan. Environmental Science and Pollution Research 24, 11, 10630–10639.

Resco de Dios, V., **Geßler, A.**, Ferrio, J. P., Alday, J. G., Bahn, M., del Castillo, J., Devidal, S., García-Muñoz, S., **Kayler, Z.**, Landais,

D., Martín-Gómez, P., Milcu, A., Piel, C., **Pirhofer-Walzl, K.**, Ravel, O., Salekin, S., Tissue, D. T., Tjoelker, M. G., Voltas, J., Roy, J. (2017) Circadian rhythms regulate the environmental responses of net CO_2 exchange in bean and cotton canopies. Agricultural and Forest Meteorology 239, 185–191.

Rivaroli, S., Ghelfi, R., Bertazzoli, A., **Piorr, A.** (2017) Diversification pathways and farming systems: Insights from the Emilia-Romagna region, Italy. Outlook on Agriculture 46, 4, 239–247.

Roces-Díaz, J. V., **Burkhard, B.**, Kruse, M., Müller, F., Díaz-Varela, E. R., Álvarez-Álvarez, P. (2017) Use of ecosystem information derived from forest thematic maps for spatial analysis of ecosystem services in northwestern Spain. Landscape and Ecological Engineering 13, 1, 45–57.

Rommel, J., Hermann, D., Müller, M., Mußhoff, O. (2017) Comprehension in risk elicitation experiments. Applied Economics Letters 24, 9, 627–634.

Ruser, R., Fuß, R., **Andres, M.**, Hegewald, H., Kesenheimer, K., Köbke, S., Räbiger, T., Quinones, T. S., **Augustin, J.**, Christen, O., Dittert, K., Kage, H., Lewandowski, I., Prochnow, A., Stichnothe, H., Flessa, H. (2017) Nitrous oxide emissions from winter oilseed rape cultivation. Agriculture, Ecosystems & Environment 249, 57–69.

Sam, A. S., Kumar, R., **Kächele, H.**, **Müller, K.** (2017) Quantifying household vulnerability triggered by drought: evidence from rural India. Climate and Development 9, 7, 618–633.

Sam, A. S., Kumar, R., **Kächele, H.**, **Müller, K.** (2017) Vulnerabilities to flood hazards among rural households in India. Natural Hazards 88, 2, 1133–1153.

Schindler, J., **Graef, F.**, **König, H. J.**, Mchau, D. (2017) Developing community-based food security criteria in rural Tanzania. Food Security 9, 6, 1285–1298.

Schindler, U., **Barkusky, D.**, **Mirschel, W.**, **Eulenstein, F.** (2017) Long-term soil hydrological data of a Pleistocene region in North-East Germany. Open Data Journal for Agricultural Research 3, 4–9.

Schindler, U., **Lischeid, G.**, **Müller, L.** (2017) Hydraulic performance of horticultural substrates - 3. impact of substrate composition and ingredients. Horticulturae 3, 1, Article 7.

Schindler, U., **Müller, L.** (2017) Hydraulic performance of horticultural substrates - 2. development of an evaluation framework. Horticulturae 3, 1, Article 6.

Schindler, U., **Müller, L.**, **Eulenstein, F.** (2017) Hydraulic performance of horticultural substrates - 1. method for measuring the hydraulic quality Indicators. Horticulturae 3, 1, Article 5.

Schmidt, M., **Jochheim, H.**, **Kersebaum, K.-C.**, **Lischeid, G.**, **Nendel, C.** (2017) Gradients of microclimate, carbon and nitrogen in transition zones of fragmented landscapes–a review. Agricultural and Forest Meteorology 232, 659–671.

Schmidt, M., **Weißhuhn, P.**, **Augustin, J.**, **Funk, R.**, **Häfner, K.**, **König, H. J.**, **Loft, L.**, **Merz, C.**, **Meyer, C.**, **Piorr, A.**, **Reutter, M.**, **Stachow, U.**, **Stein-Bachinger, K.**, **Matzdorf, B.** (2017) Evaluation of the ecosystem services approach in agricultural literature. One Ecosystem 2, e11613. ⓐ

Schönenberg, R., Boy, J., Hartberger, K., Schumann, C., Guggenberger, G., Siebold, M., Lakes, T., Lamparter, G., Schindewolf, M., Schaldach, R., **Nendel, C.**, Hohnwald, S., Meurer, K. H. E., Gerold, G., Klingler, M. (2017) Experiences of inter- and transdisciplinary research - a trajectory of knowledge integration within a large research consortium. Erdkunde 71, 3, 177–193.

Selecky, T., **Bellingrath-Kimura, S. D.**, Kobata, Y., Yamada, M., Guerrini, I. A., Umemura, H. M., Dos Santos, D. A. (2017) Changes in carbon cycling during development of successional agroforestry. Agriculture 7, 3, Article 25. ⓐ

Serrano, L., Reina, M., Quintana, X. D., Romo, S., Olmo, C., Soria, J. M., Blanco, S., Fernández-Aláez, C., Fernández-Aláez, M., Caria, M. C., Bagella, S., **Kalettka, T.**, **Pätzig, M.** (2017) A new tool for the assessment of severe anthropogenic eutrophication in small shallow water bodies. Ecological Indicators 76, 324–334.

Sieber, S., **Graef, F.**, Amjath-Babu, T. S., Mutabazi, K. D., Tumbo, S. D., Faße, A., Gomez Y Paloma, S., **Rybak, C.**, Lana, M., Ndah, T. H., **Uckert, G.**, **Schuler, J.**, Grote, U. (2017) Trans-SEC's food security research in Tanzania: principles, research models and assumptions. Food Security 9, 6, 1147–1155.

Sieber, S., **Graef, F.**, Amjath-Babu, T. S., Mutabazi, K. D., Tumbo, S. D., Faße, A., Gomez Y Paloma, S., **Rybak, C.**, Ndah, H. T., **Uckert, G.**, **Schuler, J.**, Grote, U. (2017) Introduction to a special issue: regional food and nutritional security in Tanzania - methods, tools and applications (Editorial). Food Security 9, 6, 1143–1145.

Siebert, S., Webber, H., Zhao, G., **Ewert, F.** (2017) Heat stress is overestimated in climate impact studies for irrigated agriculture. Environmental Research Letters 12, 5, Article 054023. ⓐ

Souza, I. F., Almeida, L. F. J., Jesus, G. L., **Kleber, M.**, Silva, I. R. (2017) The mechanisms of organic carbon protection and dynamics of C-saturation in Oxisols vary with particle-size distribution. European Journal of Soil Science 68, 5, 726–739.

Specht, K., Sanyé-Mengual, E. (2017) Risks in urban rooftop agriculture: assessing stakeholders' perceptions to ensure efficient policymaking. Environmental Science & Policy 69, 13–21.

Srivastava, A. K., Mboh, C. M., Gaiser, T., **Ewert, F.** (2017) Impact of climatic variables on the spatial and temporal variability of crop yield and biomass gap in Sub-Saharan Africa- a case study in Central Ghana. Field Crops Research 203, 33–46.

Steinhoefel, G., Breuer, J., Blanckenburg, F. v., Horn, I., **Sommer, M.** (2017) The dynamics of Si cycling during weathering in two small catchments in the Black Forest (Germany) traced by Si isotopes. Chemical Geology 466, 389–402.

Sun, Z., Sänger, A., **Rebensburg, P.**, **Lentzsch, P.**, **Wirth, S.**, Kaupenjohann, M., Meyer-Aurich, A. (2017) Contrasting effects of biochar on N₂O emission and N uptake at different N fertilizer levels on a temperate sandy loam. Science of the Total Environment 578, 557–565. ⓐ

Sutherland, L.-A., Madureira, L., Dirimanova, V., Bogusz, M., Kania, J., Vinohradnik, K., Creaney, R., Duckett, D., Koehnen, T., **Knierim, A.** (2017) New knowledge networks of small-scale farmers in Europe's periphery. Land Use Policy 63, 428–439. ⓐ

Tanneberger, F., Tegetmeyer, C., Busse, S., Barthelmes, A., Shumka, S., Moles Mariné, A., Jenderedjian, K., Steiner, G. M., Essl, F., Etzold, J., Mendes, C., Kozulin, A., Frankard, P., Milanović, Đ., Ganeva, A., Apostolova, I., Alegro, A., Delipetrou, P., Navrátilová, J., Risager, M., Leivits, A., Fosaa, A. M., Tuominen, S., Muller, F., Bakuradze, T., **Sommer, M.**, Christanis, K., Szurdoki, E., Oskarsson, H., Brink, S. H., Connolly, J., Bragazza, L., Martinelli, G., Aleksāns, O., Priede, A., Sungaila, D., Melovski, L., Belous, T., Saveljić, D., de Vries, F., Moen, A., Dembek, W., Mateus, J., Hanganu, J., Sirin, A., Markina, A., Napreenko, M., Lazarević, P., Šefferová Stanová, V., Skoberne, P., Heras Pérez, P., Pontevedra-Pombal, X., Lonnstad, J., Küchler, M., Wüst-Galley, C., Kirca, S., Mykytiuk, O., Lindsay, R., Joosten, H. (2017) The peatland map of Europe. Mires and Peat 19, Article 22. ⓐ

Tao, F., Rötter, R. P., Palosuo, T., Díaz-Ambrona, C. G. H., Mínguez, M. I., Semenov, M. A., **Kersebaum, K.-C.**, **Nendel, C.**, Cammarano, D., Hoffmann, H., **Ewert, F.**, Dambreville, A., Martre, P., Rodríguez, L., Ruiz-Ramos, M., Gaiser, T., Höhn, J. G., Salo, T., Ferrise, R., Bindi, M., Schulman, A. H. (2017) Designing future barley ideotypes using a crop model ensemble. European Journal of Agronomy 82, Part A, 144–162.

Techen, A.-K., **Helming, K.** (2017) Pressures on soil functions from soil management in Germany: a foresight review. Agronomy for Sustainable Development 37, 6, Article: 64. ⓐ

Teixeira, E. I., Zhao, G., de Ruiter, J., Brown, H., Ausseil, A.-G., Meenken, E., **Ewert, F.** (2017) The interactions between genotype, management and environment in regional crop modelling. European Journal of Agronomy 88, 106–115.

Tekken, V., Spangenberg, J. H., **Burkhard, B.**, Escalada, M., Stoll-Kleemann, S., Truong, D. T., Settele, J. (2017) »Things are different now«: farmer perceptions of cultural ecosystem services of traditional rice landscapes in Vietnam and the Philippines. Ecosystem Services 25, 153–166.

Terleev, V. V., **Mirschel, W.**, Badenko, V. L., Guseva, I. Y. (2017) An improved Mualem-Van Genuchten method and its verification using data on Beit Netofa clay. Eurasian Soil Science 50, 4, 445–455 [Original Russian text published in Pochvovedenie, 2017, No. 4, pp. 457–467].

Terleev, V., Nikonorov, A., Togo, I., Volkova, Y., Ginevsky, R., Lazarev, V., Khamzin, E., Garmanov, V., **Mirschel, W.**, Akimov, L. (2017) Hysteretic water-retention capacity of sandy soil. Magazine of Civil Engineering, 2, 84–92. ⓐ

Tippelt, L., **Walther, D.**, Kampen, H. (2017) The thermophilic mosquito species Uranotaenia unguiculata Edwards, 1913 (Diptera: Culicidae) moves north in Germany. Parasitology Research 116, 12, 3437–3440.

Uckert, G., **Hafner, J.**, **Graef, F.**, **Hoffmann, H.**, Kimaro, A., Sererya, O., **Sieber, S.** (2017) Farmer innovation driven by needs and understanding: building the capacities of farmer groups for improved cooking stove construction and continued adaptation. Environmental Research Letters 12, 12, Article 125001. ⓐ

Ungaro, F., **Zasada, I.**, **Piorr, A.** (2017) Turning points of ecological resilience: geostatistical modelling of landscape change and bird habitat provision. Landscape and Urban Planning 157, 297–308.

Uthes, S., Li, F., Kelly, E. (2017) Does EU rural expenditure correspond to regional development needs? Land Use Policy 60, 267–280.

van der Meij, M., Temme, A. J. A. M., Wallinga, J., **Hierold, W.**, **Sommer, M.** (2017) Topography reconstruction of eroding landscapes - a case study from a hummocky ground moraine (CarboZALF-D). Geomorphology 295, 758–772.

Veresoglou, S. D., **Wulf, M.**, Rillig, M. C. (2017) Facilitation between woody and herbaceous plants that associate with arbuscular mycorrhizal fungi in temperate European forests. Ecology and Evolution 7, 4, 1181–1189. ⓐ

Verheyen, K., De Frenne, P., Baeten, L., Waller, D. M., Hédl, R., Perring, M. P., Blondeel, H., Brunet, J., Chudomelová, M., Decocq, G., De Lombaerde, E., Depauw, L., Dirnböck, T., Durak, T., Eriksson, O., Gilliam, F. S., Heinken, T., Heinrichs, S., Hermy, M., Jaroszewicz, B., Jenkins, M. A., Johnson, S. E., Kirby, K. J., Kopecký, M., Landuyt, D., Lenoir, J., Li, D., Macek, M., Maes, S. L., Máliš, F., Mitchell, F. J. G., **Naaf, T.**, Peterken, G., Petřík, P., Reczyńska, K., Rogers, D. A., Schei, F. H., Schmidt, W., Standovár, T., Świerkosz, K., Ujházy, K., Van Calster, H., Vellend, M., Vild, O., Woods, K., **Wulf, M.**, Bernhardt-Römermann, M. (2017) Combining biodiversity resurveys across regions to advance global change research. BioScience 67, 1, 73–83.

Vilvert, E., Costa, M. D., Cangahuala-Inocente, G. C., Lovato, P. E. (2017) Root proteomic analysis of grapevine rootstocks inoculated with Rhizophagus irregularis and Fusarium oxysporum f. sp. herbemontis. Revista Brasileira de Ciência do Solo 41, e0160134. ⓐ

Wallor, E., **Kersebaum, K.-C.**, Lorenz, K., Gebbers, R. (2017) Connecting crop models with highly resolved sensor observations to improve site-specific fertilisation. Advances in Animal Biosciences 8, 2, 689–693.

Walther, D., Kampen, H. (2017) The citizen science project »Mueckenatlas' helps

monitor the distribution and spread of invasive mosquito species in Germany. Journal of Medical Entomology 54, 6, 1790–1794. ⓐ

Walther, D., Scheuch, D. E., Kampen, H. (2017) The invasive Asian tiger mosquito Aedes albopictus (Diptera: Culicidae) in Germany: local reproduction and overwintering. Acta Tropica 166, 186–192.

Wambura, F. J., **Dietrich, O.**, **Lischeid, G.** (2017) Evaluation of spatio-temporal patterns of remotely sensed evapotranspiration to infer information about hydrological behaviour in a data-scarce region. Water 9, 5, Article: 333. ⓐ

Wang, E., Martre, P., Zhao, Z., **Ewert, F.**, Maiorano, A., Rötter, R. P., Kimball, B. A., Ottman, M. J., Wall, G. W., White, J. W., Reynolds, M. P., Alderman, P. D., Aggarwal, P. K., Anothai, J., Basso, B., Biernath, C., Cammarano, D., Challinor, A. J., De Sanctis, G., Doltra, J., Fereres, E., Garcia-Vila, M., Gayler, S., Hoogenboom, G., Hunt, L. A., Izaurralde, R. C., Jabloun, M., Jones, C. D., **Kersebaum, K.-C.**, Koehler, A.-K., Liu, L., Müller, C., Naresh Kumar, S., **Nendel, C.**, O'Leary, G., Olesen, J. E., Palosuo, T., Priesack, E., Eyshi Rezaei, E., Ripoche, D., Ruane, A. C., Semenov, M. A., Shcherbak, I., Stöckle, C., Stratonovitch, P., Streck, T., Supit, I., Tao, F., Thorburn, P., Waha, K., Wallach, D., Wang, Z., Wolf, J., Zhu, Y., Asseng, S. (2017) The uncertainty of crop yield projections is reduced by improved temperature response functions. Nature Plants 3, Article Number 17102.

Wangai, P. W., **Burkhard, B.**, Kruse, M., Müller, F. (2017) Contributing to the cultural ecosystem services and human wellbeing debate: a case study application on indicators and linkages. Landscape Online 50, 1–27. ⓐ

Watson, C. A., **Reckling, M.**, **Preißel, S.**, **Bachinger, J.**, Bergkvist, G., Kuhlman, T., Lindström, K., Nemecek, T., Topp, C. F. E., Vanhatalo, A., **Zander, P.**, Murphy-Bokern, D., Stoddard, F. L. (2017) Grain legume production and use in European agricultural systems. Advances in Agronomy 144, 235–303.

Webber, H., Martre, P., Asseng, S., Kimball, B., White, J., Ottman, M., Wall, G. W., De Sanctis, G., Doltra, J., Grant, R., Kassie, B., Maiorano, A., Olesen, J. E., Ripoche, D., Rezaei, E. E., Semenov, M. A., Stratonovitch, P., **Ewert, F.** (2017) Canopy temperature for simulation of heat stress in irrigated wheat in a semi-arid environment: a multi-model comparison. Field Crops Research 202, 21–35.

Wegehenkel, M., Rummel, U., Beyrich, F. (2017) Longterm analysis of measured and simulated evapotranspiration and soil water content. Hydrological Sciences Journal 62, 10, 1532–1550.

Wegehenkel, M., Wagner, A., Amoriello, T., Fleck, S., Meesenburg, H., Raspe, S. (2017) Impact of stoniness correction of soil hydraulic parameters on water balance simulations of forest plots. Journal of Plant Nutrition and Soil Science 180, 1, 71–86.

Weißhuhn, P., **Reckling, M.**, **Stachow, U.**, Wiggering, H. (2017) Supporting agricultural

ecosystem services through the integration of perennial polycultures into crop rotations. Sustainability 9, 12, Article: 2267. ⓐ

Weltin, M., **Zasada, I.**, Franke, C., **Piorr, A.**, Raggi, M., Viaggi, D. (2017) Analysing behavioural differences of farm households: an example of income diversification strategies based on European farm survey data. Land Use Policy 62, 172–184. ⓐ

Werner, M., Wauters, E., Bijttebier, J., Steinmann, H.-H., Ruysschaert, G., **Knierim, A.** (2017) Farm level implementation of soil conservation measures: farmers' beliefs and intentions. Renewable Agriculture and Food Systems 32, 6, 524–537.

Westphalen, M. A., **Lischeid, G.**, Meier-Uhlherr, R., Zak, D. (2017) Abschätzung der Phosphorbelastung des Vorfluters eines degradierten Quellmoores in NO-Brandenburg. Telma 47, 25–44.

Wieland, R., **Kerkow, A.**, **Früh, L.**, Kampen, H., **Walther, D.** (2017) Automated feature selection for a machine learning approach toward modeling a mosquito distribution. Ecological Modelling 352, 108–112.

Wieland, R., **Mirschel, W.** (2017) Combining expert knowledge with machine learning on the basis of fuzzy training. Ecological Informatics 38, 26–30.

Wielinga, E., Koutsouris, A., **Knierim, A.**, Guichaoua, A. (2017) Generating space for innovations in agriculture: the AgriSpin project. Studies in Agricultural Economics 119, 1, 26–33.

Wilken, F., Fiener, P., Van Oost, K. (2017) Modelling a century of soil redistribution processes and carbon delivery from small watersheds using a multi-class sediment transport model. Earth Surface Dynamics 5, 1, 113–124. ⓐ

Wilken, F., **Sommer, M.**, Van Oost, K., Bens, O., Fiener, P. (2017) Process-oriented modelling to identify main drivers of erosion-induced carbon fluxes. SOIL 3, 2, 83–94. ⓐ

Win, K. T., Oo, A. Z., **Bellingrath-Kimura, S. D.** (2017) Influence of soil types and osmotic pressure on growth and 137Cs accumulation in blackgram (Vigna mungo L.). Journal of Environmental Radioactivity 169–170, 98–103.

Wiß, F., Ghirardo, A., Schnitzler, J.-P., **Nendel, C.**, **Augustin, J.**, **Hoffmann, M.**, Grote, R. (2017) Net ecosystem fluxes and composition of BVOCs over a maize field - interaction of meteorology and phenological stages. Global Change Biology Bioenergy 9, 11, 1627–1643. ⓐ

Wong, G. Y., **Loft, L.**, Brockhaus, M., Yang, A. L., Pham, T. T., Assembe-Mvondo, S., Luttrell, C. (2017) An assessment framework for benefit sharing mechanisms to Reduce Emissions from Deforestation and Forest Degradation within a forest policy mix. Environmental Policy and Governance 27, 5, 436–452.

Wulf, M., **Jahn, U.**, **Meier, K.**, Radtke, M. (2017) Tree species composition of a

landscape in north-eastern Germany in 1780, 1890 and 2010. Forestry 90, 2, 174–186. ⓐ

Yin, X., **Kersebaum, K.-C.**, **Kollas, C.**, Baby, S., Beaudoin, N., Manevski, K., Palosuo, T., **Nendel, C.**, Wu, L., Hoffmann, M., Hoffmann, H., Sharif, B., Armas-Herrera, C. M., Bindi, M., Charfeddine, M., Conradt, T., Constantin, J., **Ewert, F.**, Ferrise, R., Gaiser, T., de Cortazar-Atauri, I. G., Giglio, L., Hlavinka, P., **Lana, M.**, Launay, M., Louarn, G., Manderscheid, R., Mary, B., **Mirschel, W.**, Moriondo, M., Öztürk, I., Pacholski, A., Ripoche-Wachter, D., Rötter, R. P., Ruget, F., Trnka, M., Ventrella, D., Weigel, H.-J., Olesen, J. E. (2017) Multi-model uncertainty analysis in predicting grain N for crop rotations in Europe. European Journal of Agronomy 84, 152–165.

Yin, X., **Kersebaum, K.-C.**, Kollas, C., Manevski, K., Baby, S., Beaudoin, N., Öztürk, I., Gaiser, T., Wu, L., Hoffmann, M., Charfeddine, M., Conradt, T., Constantin, J., **Ewert, F.**, de Cortazar-Atauri, I. G., Giglio, L., Hlavinka, P., Hoffmann, H., Launay, M., Louarn, G., Manderscheid, R., Mary, B., **Mirschel, W.**, **Nendel, C.**, Pacholski, A., Palosuo, T., Ripoche-Wachter, D., Rötter, R. P., Ruget, F., Sharif, B., Trnka, M., Ventrella, D., Weigel, H.-J., Olesen, J. E. (2017) Performance of process-based models for simulation of grain N in crop rotations across Europe. Agricultural Systems 154, 63–77.

Zasada, I., **Häfner, K.**, Schaller, L., van Zanten, B. T., Lefebvre, M., Malak-Rawlikowska, A., Nikolov, D., Rodríguez-Entrena, M., Manrique, R., Ungaro, F., Zavalloni, M., Delattre, L., **Piorr, A.**, Kantelhardt, J., Verburg, P. H., Viaggi, D. (2017) A conceptual model to integrate the regional context in landscape policy, management and contribution to rural development: literature review and European case study evidence. Geoforum 82, 1–12. ⓐ

Zasada, I., **Piorr, A.**, Novo, P., Villanueva, A. J., Valánszki, I. (2017) What do we know about decision support systems for landscape and environmental management? A review and expert survey within EU research projects. Environmental Modelling & Software 98, 63–74.

Zhao, C., Liu, B., Piao, S., Wang, X., Lobell, D. B., Huang, Y., Huang, M., Yao, Y., Bassu, S., Ciais, P., Durand, J.-L., Elliott, J., **Ewert, F.**, Janssens, I. A., Li, T., Lin, E., Liu, Q., Martre, P., Müller, C., Peng, S., Peñuelas, J., Ruane, A. C., Wallach, D., Wang, T., Wu, D., Liu, Z., Zhu, Y., Zhu, Z., Asseng, S. (2017) Temperature increase reduces global yields of major crops in four independent estimates. Proceedings of the National Academy of Sciences 114, 35, 9326–9331.

Zimmermann, A., Webber, H., Zhao, G., **Ewert, F.**, Kros, J., Wolf, J., Britz, W., de Vries, W. (2017) Climate change impacts on crop yields, land use and environment in response to crop sowing dates and thermal time requirements. Agricultural Systems 157, 81–92.

Zscheischler, J., **Rogga, S.**, **Busse, M.** (2017) The adoption and implementation of transdisciplinary research in the field of land-use science - a comparative case study. Sustainability 9, 11, Article: 1926. ⓐ

IMPRINT

ABBREVIATIONS

ACTA	Association de Coordination Technique Agricole
AgMIP	Agricultural Model Intercomparison and Improvement Project
ARL	Akademie für Raumforschung und Landesplanung
ATB	Leibniz-Inst. für Agrartechnik und Bioökonomie / Leibniz Inst. for Agricultural Engineering and Bioeconomy
BAM	Bundesanstalt für Materialforschung und -prüfung / Bundesanstalt für Materialforschung und -prüfung
BLF	Inst. für Bodenlandschaftsforschung / Inst. of Soil Landscape Research
BMBF	Bundesministerium für Bildung und Forschung / Federal Ministry of Education and Research
BMEL	Bundesministerium für Ernährung und Landwirtschaft / Federal Ministry of Food and Agriculture
BVL	Bundesamt für Verbraucherschutz und Lebensmittelsicherheit / Federal Office of Consumer Protection and Food Safety
CEMA	Comite Europeen des groupements de constructeurs du Machinisme Agricole
COST	European Cooperation in Science and Technology
Delphy	Delphy, Wageningen, Niederlande
DFG	Deutsche Forschungsgemeinschaft
DIN	Deutsches Inst. für Normung / German Inst. for Standardization
DIR	Direktorat / Directorate
DLG	Deutsche Landwirtschaftsgesellschaft / German Agricultural Society
DSMZ	Leibniz-Institut DSMZ - Deutsche Sammlung von Mikroorganismen und Zellkulturen GmbH Braunschweig / Leibniz Institute DSMZ - German Collection of Microorganisms and Cell Cultures
EGU	European Geophysical Union
ERANET	European Research Area Network
FACCE	Agriculture, Food Security and Climate Change
FBH	Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik / Ferdinand-Braun-Institut, Leibniz-Institut fuer Hoechstfrequenztechnik
FHG	Fraunhofer-Gesellschaft
FLEUR	The Jülich FLAPW code family

FNR	Fachagentur Nachwachsende Rohstoffe
FONA	Forschung für nachhaltige Entwicklung / Research for Sustainable Development
FRCuma Oues	Federation regionale des cooperatives d'utilisation de materiel agricole del ouest de la France DLO - Stichting Dienst Landbouwkundig Onderzoek
FU Berlin	Freie Universität Berlin
FZ Jülich	Forschungszentrum Jülich
GRF	German Research Foundation
HU Berlin	Humboldt-Universität zu Berlin
ICRAF	The International Council for Research in Agroforestry / World Agroforestry Centre
ICRISAT	Int. Crops Research Inst. for the Semi-Arid Tropics, Patancheru, India
iCROPM	International Crop Modelling Symposium
IGB	Leibniz-Inst. für Gewässerökologie und Binnenfischerei / Leibniz-Inst. of Freshwater Ecology and Inland Fisheries
IHP	Leibniz-Inst. für innovative Mikroelektronik / Innovations for High Performance Microelectronics
INI	Iniciativas Innovadoras SAL
INRA	L'Institut national de la recherche agronomique / French National Institute for Agricultural Research
INTIA	Inst.o Navarro de Tecnologias e Infraestructuras Agroalimentarias
ISI	Fraunhofer-Inst. für System- und Innovationsforschung / Fraunhofer Inst. for Systems and Innovation Research
IZW	Leibniz-Inst. für Zoo- und Wildtierforschung / Leibniz Inst. for Zoo and Wildlife Research
JPI	Joint Programming Initiative
KIT-ITAS	Inst. für Technikfolgenabschätzung und Systemanalyse / Inst. for Technology Assessment and Systems Analysis
LBG	Inst. für Landschaftsbiogeochemie / Inst. for Landscape Biogeochemistry
LSA	Inst. für Landschaftssystemanalyse / Inst. of Landscape Systems Analysis
LSE	Inst. für Landnutzungssysteme / Inst. of Land Use Systems

LWH	Inst. für Landschaftswasserhaushalt / Inst. of Landscape Hydrology
MACSUR	Modeling European Agriculture with Climate Change for Food Security
MLUL Brandenburg	Ministerium für Umwelt, Gesundheit und Verbraucherschutz des Landes Brandenburg / Ministry of Rural Development, Environment and Agriculture of the Federal State of Brandenburg
MWFK Brandenburg	Ministerium für Wissenschaft, Forschung und Kultur des Landes Brandenburg
PIK	Potsdam-Inst. für Klimafolgenforschung / Potsdam Inst. for Climate Impact Research
SAW	Senatsausschuss Wettbewerb der Leibniz-Gemeinschaft / The Senate Competition Comitee of Leibniz Association
SDEI	Senckenberg Deutsches Entomologische Institut / Senckenberg German Entomological Institute
SO	Inst. für Sozioökonomie / Inst. of Socio-Economics
TP	Teilprojekt
TROPOS	Leibniz-Institut für Troposphärenforschung Leipzig / Leibniz Institute for Tropospheric Research
TU Berlin	Technische Universität Berlin
TUM	Technische Universität München / Technical University of Munich
UMSICHT	Fraunhofer-Institut für Umwelt-, Sicherheits-, und Energietechnik / Fraunhofer Inst. for Environmental, Safety, and Energy Technology
UN	Vereinte Nationen / United Nations
UVP-Gesellschaft	Gesellschaft für die Prüfung der Umweltverträglichkeit
WGL	Leibniz-Gemeinschaft / Leibniz Association
ZWM	Zentrum für Wissenschaftsmanagement / Center for Science and Research Management

IMPRINT

Publisher
Executive Board: Frank A. Ewert, Cornelia Rosenberg

Editors
Hendrik Schneider, Katharina Brüser, Anke Hollburg

Layout and typesetting
Nur Mut, Hannes Schulze

Copy editing
Ulrike Hagemann, Claus Dalchow

Printing
Laserline Druckzentrum Berlin KG
This annual report is available as PDF
or may be ordered in print.

We thank everyone involved in the
preparation of the annual report!

Leibniz Centre for Agricultural Landscape Research (ZALF)
Leibniz-Zentrum für Agrarlandschaftsforschung (ZALF) e. V.

Eberswalder Straße 84
15374 Müncheberg, Germany
www.leibniz-zalf.de
T +49 (0)33432 | 82 200
F +49 (0)33432 | 82 223
E zalf@zalf.de

Twitter: @zalf_leibniz
Facebook: zalf.agrarlandschaftsforschung

Copyright: ZALF, May 2018

FSC RECYCLED Papier aus Recyclingmaterial FSC® C002642
www.fsc.org

Zertifikat seit 2011
audit berufundfamilie

Leibniz
Association

IMAGE SOURCES