



Welcome to the first SFB1502 DETECT Newsletter!



EDITORIAL

DETECT: Set Out for New Shores

The International Energy Agency [recently stated](#) that in 2021 the global CO₂ emissions rebounded to their highest level in history. The IPCC in its [sixth assessment report](#) concludes that global warming, reaching 1.5°C in the near-term, would with very high confidence cause unavoidable increases in multiple climate hazards, and present multiple risks to ecosystems and humans. The report also states that risks in physical water availability and water-related hazards will with high confidence continue to increase by the mid-to long-term (2041-2100) in all assessed regions, with greater risk at higher global warming levels.

These warning signs underline the importance of the scientific questions addressed in the new Collaborative Research Center (CRC) 1502 DETECT funded by the [German Research Foundation](#): The terrestrial water cycle in the presence of climate change, the impact of land and water use and the development of effective adaptation strategies.

We are currently laying the foundations to start the project work. The first cumulative advertisement for PhD and Post-Doc positions in the scientific projects of DETECT has resulted in 1696 applications from more than 700 applicants. 15 of the 33 positions are either already filled or the employment process has been started. Shortly said: An exciting challenge is posed and we are ready to accept it, or, as Sherlock Holmes would phrase it: The game is afoot!

This is now our first newsletter. Here we intend to publish quarterly issues about activities and news within and in the scientific and political environment of DETECT. In the initial phase naturally, the focus will be on the establishment of the CRC and the associated organizational measures. Later, with increasingly gained momentum in project work, scientific results of our CRC will prevail. Also, news in the world out there will be featured, including scientific events and new findings, but also political events and decisions with a specific reference to our CRC.

This first newsletter features a recently raised Collaborative Research Grant to support sustainable agricultural landscapes in the EU and U.S. as well as a recently completed collaborative research project with the objective to improve drought risk assessments at global scale and for selected case study regions.

Of course we will rely on input from the entire CRC community and thus, will from now on ask for news from the projects on a regular basis. However, please feel always free to send us interesting news, e.g. on upcoming events, recently accepted papers, interesting results or breakthroughs.

Sincerely,

[Jürgen Kusche](#)
DETECT Speaker

[Silke Hüttel](#)
Co-Speaker

[Harry Vereecken](#)
Co-Speaker

[Frank Siegismund](#)
scientific coordinator



Notes from the DETECT coordination office

In this early phase, we faced a number of challenges, and not all are scientific ones. In this recurrent section we want to answer the most burning non-scientific questions that rise up in the course of CRC.

Information needed in the personnel processing request (PMB-Antrag); only Uni Bonn

At University of Bonn, Mrs. Voigt is responsible for all issues regarding personnel in DETECT. She asks to put 'SFB 1502 DETECT' at the field 'Institut' at the top of the form to ensure the form goes to the right person in the administration. Also, the SFB has to be stated in the employment contract. As funding source the PSP-element of the project has to be provided. The time limit for both, the contract and the funding, is 31.12.2025.

Funding for student helpers; only Uni Bonn

The student helpers (SHKs) are not paid from the DETECT scientific projects. The SHKs are funded 50% by the central project Z01 (PSP-element 52C-52397-23-71060007), and 50% by own resources of Uni Bonn (PSP-element 10C-52397-10-71060007). Please provide both PSP-elements in the personnel request form.

For **PhD students with a degree from a non-EU institution** the equivalence of the degree with a German master degree has to be approved before the employment contract can be signed. Please get in contact with Mrs. Voigt.

If you as a PI have **not been able to fill your position(s)** based on applications from our first cumulative advertisement please promote your position(s) by own means. This could also include another advertisement for just your project. The deadline for applications should however not exceed 8th of May. Based on the outcome of your own activities we will then decide about publishing another cumulative advertisement in June.

Access to the DETECT funding

With the successful recruiting of the working staff in the projects, the project work starts and the access to the DETECT funding comes into focus. Funding that has been requested in the proposal and has been confirmed by the DFG is accessible, specifically employment of SHKs or purchase of instruments as requested. However, reallocating money within a project or requests for additional funds need a decision of the CRC board based on the bylaws of the CRC. These decisions have to be postponed until the bylaws have been ratified during the first general meeting of the CRC on May 2nd. Forms for these requests are in preparation to simplify and standardize the procedure.



Notes from the projects

New affiliation

Project A05 will be hosted by University of Göttingen as Silke Hüttel and Stefan Seifert will move by summer term and form the new group

“Agricultural and Food Business Management” at the Department of Agricultural Economics and Rural Development. We wish them a good start at their new domain.



Collaborative Research Grant “Supporting Sustainable Agricultural Landscapes in the EU and U.S.”

by Halle Institute for Global Research and The Halle Foundation at Emory University, U.S.



from left to right: Emily Burchfield, Silke Hüttel, Tobia Lakes, Saskia Wolff

Researchers from Bonn University (Silke Hüttel; DETECT A05 + A06), Humboldt-Universität zu Berlin (Tobia Lakes) and Emory University (Emily Burchfield) were successfully granted a collaborative effort on intentional support of a transition towards more sustainable, resilient agricultural systems by the Halle Institute for Global Research, targeted to support exchange between Emory and Germany-based researchers. The team aims at sharing and advancing collaborative work in (1) defining, measuring, and monitoring current agricultural landscapes, (2) identifying major forces that transform agricultural landscapes and (3) describing viable transition pathways towards sustainable, resilient, and just agricultural futures. This work is closely related to A06, and the teams look forward to future exchange. The first of three workshops will be held from 30th May to 2nd June

2022 at Göttingen University. Please feel free to contact Saskia Wolff for further information (s.wolff@ilr.uni-bonn.de)

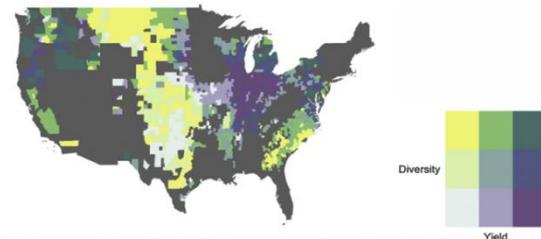


Figure 1: Regions in dark green are both highly diverse and highly productive (winter wheat). Yellow regions are highly diverse, but with low productivity, and purple regions are highly productive but with low diversity

Burchfield, Emily K.; Nelson, Katherine S.; Spangler, Kaitlyn (2019): The impact of agricultural landscape diversification on U.S. crop production. In: *Agriculture, Ecosystems & Environment* 285, S. 106615. DOI: 10.1016/j.agee.2019.106615.



Collaborative Research Project “GlobeDrought” developed advanced methods in drought risk assessment

by Stefan Siebert (Institute of Crop Science, University of Goettingen) and Jürgen Kusche (Institute of Geodesy and Geoinformation, University of Bonn)

Droughts exceed all other natural hazards in terms of the number of people affected. Researchers from University of Göttingen (Stefan Siebert, DETECT B05) and University of Bonn (Jürgen Kusche, DETECT A02, C03, D07, Z01) contributed to the collaborative research project GlobeDrought with the objective to improve drought risk assessments at global scale and for selected case study regions such as Southern Africa. The components drought hazard, exposure and vulnerability for irrigated and rainfed agricultural systems and the water supply sector were integrated to calculate drought risk. Indicators for meteorological, hydrological and agronomic drought hazards were obtained at high spatial resolution by combining satellite remote sensing, precipitation data analysis and hydrological and crop modeling. The exposure of irrigated and rainfed crops was explicitly considered. To analyze drivers, spatial patterns and temporal dynamics of drought vulnerability, expert surveys were performed systematically resulting in vulnerability indicators and their weights for the sectors considered in the

project. The results of the drought risk analysis were validated by comparing computed drought risk to drought impacts such as yield losses (Figure 2), economic losses, the number of affected people reported in global and regional data bases and total water storage changes detected from GRACE satellite data. In addition to the analysis for the historical period since 1981 an experimental drought early warning system was developed and tested providing 7-months forecasts of the drought situation.

The results of the project, which was funded by BMBF as part of the funding measure GRoW (Water as a global resource) have been published in 23 articles in peer-reviewed scientific journals. The methods to quantify drought impacts developed in GlobeDrought represent an excellent starting point for the research activities in DETECT because changes in land use and effects of human water use on drying and wetting patterns are largest during drought events.

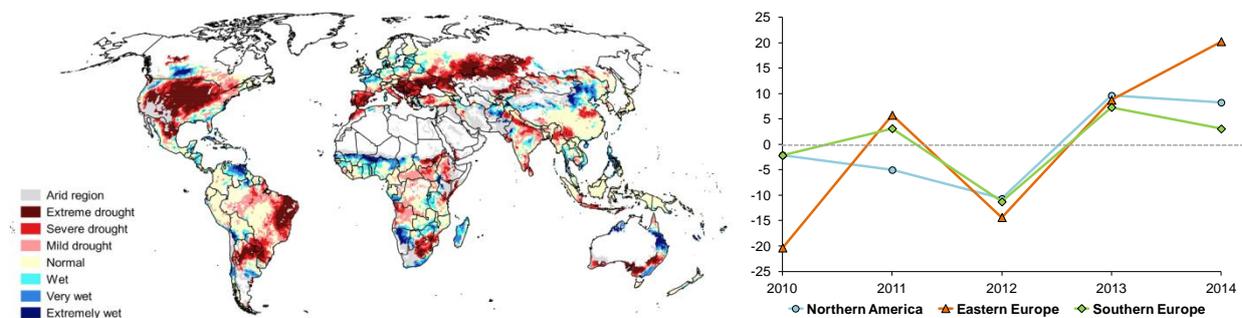


Figure 2. Drought hazard for rainfed agricultural systems calculated for year 2012 (left) and anomalies in cereal production in period 2010 to 2014 reported by FAO (percentage, relative to the annual mean production in that period) for the drought affected regions Northern America, Eastern Europe and Southern Europe.



DETECT scientists

Interview with Frank Siegismund, scientific coordinator of DETECT

Frank, what attracts you to work in DETECT?

There are mainly two reasons. There is first of all this important scientific question posed in the CRC about the impact of land and water use on the terrestrial water cycle and how this impact might be controlled particularly by policy. To answer this question is a valuable contribution to the necessary adaptation process to climate change. And second, I like this very cross-disciplinary approach that is necessary to treat the scientific challenges DETECT is confronted with, including all the interdependencies of the different components to be considered as for example soil moisture, the physiology of a root plant and a farmer's decision on land use.

What do you see as the big challenge of the CRC?

What makes the CRC attractive, I believe, is also challenging: the myriads of questions from

different disciplines, and the interdependencies of all these questions. This is reflected in the coupling of the components of the earth system model applied as the central instrument of the CRC. Uncertainty in one component will cause uncertainty in other components. At the end the puzzle should, however, offer a picture, though some pieces surely will be missing.

And what do you see as your personal challenge in your role in DETECT?

For me, being a scientific coordinator is a completely new role. In former positions I was bound to my own detailed questions, so some small pieces of the puzzle, to remain in the picture. Now, as coordinator of DETECT, though certainly a lot of my work is rather technical, it will also be necessary to have a clou on the whole thing to support the piecing together of the puzzle. And that means to some extent an understanding of all the components in the system.

About Frank Siegismund

Frank Siegismund is a climate scientist with a specific interest in the detection and projection of variations and changes in the earth climate system. Based on hydrodynamic ocean modeling and exploiting space-borne gravity and altimetry data he has investigated high resolution sea level change as well as the mass redistribution in the earth climate system. He has worked with the Nansen Environmental and Remote Sensing Center Bergen, Norway, the University of Hamburg and the Technical University of Munich. As member of the managing board he is now the scientific coordinator of DETECT.





Recent and Upcoming Events

21-27 May 2022: EGU (European Geosciences Union)

The EGU General Assembly 2022 will bring together geoscientists from all over the world for one meeting covering all disciplines of the Earth, planetary, and space sciences.

Register [here](#).

21-27 May 2022: ESA Living Planet in Bonn

This symposium focuses on how Earth observation contributes to science and society, and how disruptive technologies and actors are changing the traditional Earth observation landscape, which is also creating new opportunities for public and private sector interactions.

Register [here](#).

7-9 June: Venti Eventi

The purpose of the 6th Satellite Soil Moisture and Application Workshop is to discuss and reconcile recent methodological advances in the development, validation and application of global satellite soil moisture observations.

Registration and abstract submission [here](#).

8-10 June: GTAP (Global Trade Analysis Project)

25th Annual Conference on Global Economic Analysis "Accelerating Economic Transformation, Diversification and Job Creation"

Registration and abstract submission [here](#).

27-29 June: EWEPA

EWEPA is the leading biennial conference devoted to the methodology and application of productivity, efficiency and performance analysis of firms, public services and industries, joining academics and practitioners from all continents.

Registration and abstract submission [here](#).

21 August: Pattern Recognition in Remote Sensing Workshop (in conjunction with ICPR)

As one of the flagship events of the International Association for Pattern Recognition, Pattern Recognition in Remote Sensing Workshop serves as an event bringing together researchers from both pattern recognition and remote sensing, with emphasis on the application of pattern recognition methods to remotely sensed data.

More info soon, or ask Ribana Roscher (ribana.roscher@uni-bonn.de) who will co-organize the workshop; website from the last workshop: <http://iapr-tc7.ipb.uni-bonn.de/prrs2020/>



Announcements – save the date!

Activities within DETECT

02 May, 10:00-12:00: DETECT first general meeting (online via Zoom)

This meeting will be the constitutive kickoff for DETECT for ratification of the bylaws, election of speakers and directorate, and admission of associate members. A short report on recent DETECT activities will be provided. After the kickoff an informal get-together in Poppelsdorf is planned; the exact whereabouts will depend on weather and covid regulations and will be communicated in advance. Please mark this in your agenda!

IRTG lecture series

To introduce the students to interdisciplinary science conducted in the CRC, a lecture series will be held twice a year. The series will address the different disciplines in an introductory fashion, beginning with concepts and techniques relevant for research in modelling and observation of the water cycle, as well as of the land surface and its use, also beyond what is applied in current CRC projects. The series will consist of 6-hour blocks held monthly during the summer and winter semester, alternating between Bonn and Jülich. To reduce any disadvantage from travelling times, we offer all lectures in a hybrid form. More information will follow.

Dates: 17 May, 21 June, 12 July, 11 Oct., 15 Nov., 20 Dec

DETECT Cluster Meetings

The cluster meetings will serve as communication and planning instrument within the four scientific clusters of DETECT. The calendar weeks of the meetings are already determined. Further planning is up to the representatives of the clusters.

SFB1502 – DETECT - is a Collaborative Research Center run by the University of Bonn and participating institutions FZ Jülich, the Universities of Cologne and Göttingen, and the DWD, and funded by the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) – SFB 1502/1-2022 - 450058266.

Dates for cluster meetings in 2022:

week 18 (02.-06.May)

week 29 (18.-22.July)

week 43 (24.-28.Oct.)

DETECT Seminar:

Mondays at 10:15

11 April: Petra Friederichs, TBD

25 April: Stephanie Fiedler, ‚Meteorological research on renewable power in the HERZ research area Climate Monitoring and Diagnostics‘

9 May: Stefan Siebert, TBD

30 May: Arianna Valmassoi/Jan Keller, TBD

27 June: Ribana Roscher, ‚Data Science for Remote Sensing Applications‘

Other announcements

CESOC Seminar Series “My research” summer term 2022:

will be held via Zoom and is open to any interested person within the CESOC research disciplines (any Earth system sciences, mathematics or computer science),

see <https://cesoc.net/my-research-summer-term-2022/>

Congratulations

Jürgen Gall’s ERC Consolidator Grant “FORHUE - Forecasting and Preventing Human Errors” got accepted - congrats Jürgen!