Programme

8th to 12th October 2018
Umweltforum and Neue Mälzerei, Berlin, Germany
General Information

Conference Office
Dr. Hildegard Feldmann
F&U confirm
Permoserstraße 15
04318 Leipzig
fon 0341 235 2264
fax 0341 235 2782
tereno2018@fu-confirm.de

Information desk
Umweltforum, Foyer

Opening hours
Mon: 19:00 – 21:00
Tue: 8:00 – 19:00
Wed: 8:00 – 19:00
Thu: 8:00 – 17:00

Meeting Room
The conference takes place at two venues of „BESONDERE ORTE“, which are within five minutes walking distance: „Umweltforum“ and „Neue Mälzerei“. The Umweltforum is comprised of a church that is over a hundred years old with a modern, light-filled extension building. The centrepiece of this venue is its vast hall, ringed by galleries and featuring an Eule pipe organ. Right around the corner, the venue Neue Mälzerei is housed in a former brewery.

Wifi
Besondere Orte Ufo
Pswd: [not shown online]
Besondere Orte Mälzerei
Pswd: [not shown online]

Venue
The conference takes place at two venues of „BESONDERE ORTE“, which are within five minutes walking distance: „Umweltforum“ and „Neue Mälzerei“. The Umweltforum is comprised of a church that is over a hundred years old with a modern, light-filled extension building. The centrepiece of this venue is its vast hall, ringed by galleries and featuring an Eule pipe organ. Right around the corner, the venue Neue Mälzerei is housed in a former brewery.

Meeting Room
The general meeting room „Seminar 12“ is available to conference attendees for individual use. It is located in the Umweltforum, second floor. Please contact the conference information desk to book a slot in advance.

Food & drinks
Snacks and drinks are served before 9 am, during the coffee breaks, lunch, and poster sessions. Lunch is served between 12 and 1 pm. Groceries, bakeries, and diners, are available in easy walking distance around the venue and Alexanderplatz (see the map provided).

Thank you!
We would like to thank all participants for their contributions and wish a successful week! A big thank you for the TERENO-related Helmholtz Centres supporting this fantastic event!

Thanks also to our sponsors and exhibitors for their generous contributions and support of the TERENO 2018 conference. You have a great role in making this event a success!

Scientific Organizing Committee: Steffen Zacharias and Martin Schrön (UFZ).
Printed on Circle Matt white from 100% recycled paper with the EU Eco-label.
Leipzig, September 2018
This year, we experienced one of the severest drought periods ever recorded in the Northern and Eastern part of Germany in spite of lying in the temperate climate zone. This exceptionally long dry and hot phase affected all compartments of the terrestrial system and has led amongst other things to increased risk of forest fires, losses in the agricultural sector, restrictions on inland waterway traffic and on the operating times of nuclear power plants. In contrast to this drought situation, heavy rainfalls occurred in the Southern part of Germany leading flooded urban regions, mud avalanches and devastations of agricultural fields.

Ten years ago, six Helmholtz centers designed TERENO and established observatories exactly in these regions where these extreme events now took place. TERENO was conceived to observe in an integrated manner the different compartments of the terrestrial systems and we are now for the first time in a position to assess the impact of these extremes on our groundwater, soils, vegetation and atmosphere in a holistic approach. Over the last ten years, TERENO has provided unprecedented data that will allow to improve our understanding of the terrestrial system and to improve models that forecast the future evolution of the land surface and the critical zone. All data collected by TERENO are made available to the science community through its data portal TEODOOR. This portal increasingly receives attention as over the last years more than a billion quality-checked data have been downloaded by scientists and organizations all over the world. TERENO provides data that can be used to design adaptation measures for forest and agricultural systems and are key for the further model development and model validation. In the last years, TERENO has gained a huge visibility and the fact that so many people registered for this conference underpins this fact and demonstrates the importance of long-term observations.

TERENO hosts several sites of the Integrated Carbon Observation System, ICOS, and long-term ecological research sites, eLTER. The concept of TERENO served as a blueprint for the recently accepted European large scale research infrastructure eLTER on the EU road map. It is also the backbone of the recently deployed MOSES observational platform that aims at using modular mobile platforms to observe extreme events such as heat waves and floods. These event-based observations, however, rely on the longer time observations and measurements conducted in TERENO in order to put the measurements and novel findings into perspective. In our second conference, we offer a vibrant program of research and observational activities that are at the core of TERENO and research conducted in terrestrial systems. We offer 16 sessions covering a wide range of topics related to observing and sensing the various compartments of the land surface and the critical zone, model-data integration, fundamental hydrological and biogeochemical processes, biodiversity, geoarchives and water quality management. For each of these sessions we engaged outstanding scientists to give a keynote address on the subject and we received more than 170 abstracts. As the program of TERENO is going into print more than 185 people from 22 countries registered for the meeting.

On behalf of the organizing committee, I hope that this conference will stimulate further research in terrestrial systems and open up new collaborations amongst scientists and stakeholders interested in the future development and management of terrestrial systems.

Sincerely,
Harry Vereecken
TERENO Coordinator
Welcome address of the scientific director of the UFZ

It is my great pleasure to welcome you to the 2018 TERENO International conference.

The conference is designed to provide the best possible overview of research fields associated with modern long-term operated and integrated environmental observatories — from biodiversity research, soil research, to water research and the application of remote sensing technologies.

Starting in 2008, the infrastructure activity TERENO (Terrestrial Environmental Observatories) — a joint initiative of six Helmholtz Centres — established for long-term operated, integrated environmental observatories in Germany with the aim to investigate consequences of Global Change for terrestrial ecosystems and the socio-economic implications. Since its foundation, the TERENO network has developed into one of the most influential elements in the German landscape of environmental research infrastructures. This was also reflected in the recently published strategy paper “Long-Term Perspectives and Infrastructure in Terrestrial Research in Germany — A Systemic Approach”.

The report is the result of a working group of the Alliance of Science Organisations in Germany, devoted to terrestrial ecosystem research, and underlines the important role of TERENO in the context of, for example, the standardisation and harmonisation of investigations and securing the better availability of data.

Very recently, the Helmholtz Association started MOSES — Modular Observation Solutions for Earth Systems — a novel observing system of the Helmholtz Association, developed by the Helmholtz Centres in the research field “Earth and Environment”. It comprises highly flexible and mobile observation modules which are particularly designed to investigate the interactions of short-term events and long-term trends across Earth compartments. Heat haves, hydrologic extremes, ocean eddies and permafrost thaw will be in the focus of this new event-oriented observation and research initiative. TERENO is a key building block in the MOSES concept.
To unravel the impacts of dynamic and mainly stochastic events on Earth and environmental systems, MOSES event-oriented data sets must be analyzed in combination with large-scale and long-term monitoring data. The observation of “events versus trends” depends on the availability of long-term and large-scale data, e.g., from Helmholtz observatories such as TERENO.

Over the years, the network has also developed a reputation beyond Germany and is now seen internationally as a role model for integrated environmental research. Numerous research visits by foreign scientists and the cooperation with other research networks testify the high esteem in which TERENO is held. At the European level TERENO is seen as a “Best Example” for an integrated, long-term environmental monitoring and exploration infrastructure. This is reflected by the concept for eLTER RI, the Integrated European Long-Term Ecosystem, Critical Zone & Socio-Ecological Research Infrastructure. On September 11th, the European Strategy Forum on Research Infrastructures (ESFRI) presented the 2018 ESFRI Roadmap on Large Scale Research Infrastructures and included eLTER RI on the Roadmap.

The international reputation of TERENO and the related research was also expressed by the strategic decision of all contributing countries to hand over the lead for the eLTER ESFRI process to Germany and the UFZ in close cooperation with the Environment Agency Austria (EEA).

Developing, enhancing, integrating and harmonizing observation systems to manage global and regional environmental change is one of the key challenges of Earth Science in the anthropocene. I am convinced that your participation in the TERENO conference will help to get new insights and to demonstrate the power of interdisciplinarity, integrated science and international cooperation. Enjoy the conference and thanks for attending.

Georg Teutsch
Scientific Director
Helmholtz Centre for Environmental Research – UFZ
Innovative sensing methods for the critical zone
S. Huisman (FZJ), H. Bogena (FZJ), J. Bumberger (UFZ), M. Schrön (UFZ)

Long-term environmental observation – Advancing the understanding of Earth System in the Anthropocene
S. Zacharias (UFZ), M. Mirtl (UFZ, UBA)

Remote Sensing and Ecosystem Services
I. Hajnsek (DLR, ETH), E. Borg (DLR), H. Jörg (DLR)

Biodiversity Monitoring: Past, presence, future
S. Klotz (UFZ)

Integration of in-situ and remote sensing data for the earth surface-atmosphere system
T. Sachs (GFZ), S. Itzerott (GFZ), D. Spengler (GFZ)

Decadal and centennial variability from high-resolution bio- and geoarchives
I. Heinrich (GFZ), M. Wilmking (Uni Greifswald), A. Brauer (GFZ)

Improving water quality management using new observation and modeling strategies
M. Rode (UFZ), G. Lischeid (ZALF)

Management and integration of environmental observation data
R. Kunkel (FZJ)

Measuring and modeling water storage dynamics
A. Güntner (GFZ), T. Blume (GFZ)

Novel Approaches to monitor dynamic events
U. Weber (UFZ), M. Mauder (KIT)

Biogeochemical processes in soil-plant-atmosphere systems
N. Brüggemann (FZJ)

Relevance of soils in terrestrial matter fluxes – measurements and model concepts
H.-J. Vogel (UFZ), J. Vanderborght (FZJ)

Model-data fusion: Improving predictions and improving process understanding
H.-J. Hendricks-Franssen (FZJ)

Ecotrons and lysimeters: complementary tools for observation and experimentation on the critical zone
T. Pütz (FZJ), H. Gerke (ZALF)

Soil greenhouse gas exchange – Linking methods, bridging scales
R. Kiese (KIT), E. Priesack (HMGU), T. Sachs (GFZ)

Modeling the Hydrological System – Balancing of complexity and Uncertainty
S. Attinger (UFZ)
Umweltforum

- Registration 0 Foyer
- Icebreaker 0 Foyer
- Keynotes 0 Hall
- Lunch 0,1 Foyer
- Sessions A, F, I, L, O 0 Hall
- Poster sessions 0,1 Hall, Gallery
- Meeting room 0,1 Foyer, Gallery

Neue Mälzerei

- Sessions C, E, H, K, N 5 Plenarsaal
- Sessions B, D, G, J, M, P 5 Seminar I/II

Site map and floor plan
8:45  Welcome  
  ⚒ Prof. Georg Teutsch  
  ⚒ Scientific Director, Helmholtz Centre for Environmental Research – UFZ

Welcome  
  ⚒ Prof. Harry Vereecken  
  ⚒ TERENO Coordinator, Forschungszentrum Jülich

Keynotes

9:00  Hard Knocks: Developing Environmental Observatories for long-term observations  
  ⚒ Dr. Hank W. Loescher  
  ⚒ Director of Strategic Development, Environment and Infrastructure, Battelle-National Ecological Observatory Network (NSF-NEON), Boulder, US

9:30  Cosmic-ray hydrology: principles and detectors  
  ⚒ Prof. Marek Zreda  
  ⚒ Hydrology and Water Resources, University of Arizona

10:00  Biodiversity change across space and time using historic data and distributed networks  
  ⚒ Prof. Tiffany Knight  
  ⚒ German Center for Integrative Biodiversity Research (iDiv), Halle-Jena-Leipzig

10:30  Coffee break

11:00  Mapping evapotranspiration from flux tower and aircraft measurements – how so?  
  ⚒ Dr. Stefan Metzger  
  ⚒ National Ecological Observatory Network (NSF-NEON), Boulder, US

11:30  Recent advances in the development of radar as a tool for monitoring vegetation water dynamics  
  ⚒ Prof. Susan Steele-Dunne  
  ⚒ Civil Engineering and Geosciences, TU Delft

12:00  Lunch
Innovative sensing methods for the critical zone

S. Huisman¹, H. Bogena¹, J. Bumberger², M. Schrön²

¹Forschungszentrum Jülich, ²Helmholtz Centre for Environmental Research (UFZ)

9:30 Cosmic-ray hydrology: principles and detectors

Prof. Marek Zreda

Hydrology and Water Resources, University of Arizona

13:30 Towards understanding complex flow and transport patterns in a coastal peatland-Baltic Sea continuum.

M. Janssen¹; M. Ibenthal¹; M. Böttcher², J. Westphal²; E. Erkul³; F. Koebusch¹; G. Jurasinski²; M. Kreuzburg²; M. Voss³; J. Sültenfuß⁴; B. Lennartz¹.

¹University of Rostock; ²Leibniz Institute for Baltic Sea Research Warnemünde; ³University of Kiel; ⁴University of Bremen

13:45 An innovative combination of distributed temperature sensing and geophysics to study groundwater-surface water exchange.

J. Gaona García¹²; J. Lewandowski¹³; A. Bellin².

¹²; J. Lewandowski¹³; A. Bellin². J. Gaona García

¹¹Leibniz Institute of Freshwater Ecology and Inland Fisheries; ²University of Trento; ³IGB-Berlin

14:00 Resolving species-specific root water uptake patterns in different forest stands.

T. Blume¹; I. Heidbüchel¹; A. Güntner¹; M. Weiler; R. Stewart.

¹GFZ German Research Centre for Geosciences

14:15 Study of the distributed hydrologic response of the Claduègne catchment (Ardèche) using dense networks of rain and water level gauges.

N. Hachgenei¹; G. Nord²; B. Isabelle³.

¹Université Grenoble Alpes, IGE, Grenoble, France; ²Université Grenoble Alpes, CNRS, IRD, Grenoble-INP, IGE Grenoble, France; ³IRSTEA, UR RiverLy, Centre de Lyon-Villeurbanne, France

14:30 High-frequency dissolved gas cartography reveals groundwater discharge into a coastal freshwater pond.

E. Chatton¹; T. Labasque¹; A. Guillou²; Ch. Petton¹; L. Longuevergne¹.

¹CNRS; ²Université de Rennes

14:45 Concentration-discharge relationships from on high frequency measurement of river chemistry.

P. Flouy¹; J. Bouchez²; J. Gaillardet¹; E. Gayer²; G. Tallec³; P. Ansart³; A. Blanchouin¹.

¹IPG PARIS; ²IPGP Paris; ³IRSTEA Antony
Long-term environmental observation – Advancing the understanding of Earth System in the Anthropocene

S. Zacharias¹, M. Mirtl¹²

¹Helmholtz Centre for Environmental Research (UFZ); ²Umweltbundesamt

Keynote
9:00

Hard Knocks: Developing Environmental Observatories for long-term observations
Prof. Hank Loescher Director of Strategic Development, Environment and Infrastructure, Battelle-National Ecological Observatory Network (NSF-NEON), US

Orals
13:30

Long-term environmental monitoring infrastructures in Europe - comparability and representativeness. H. Mollenhauer¹; M. Kasner²; P. Haase³; J. Peterseil⁴; C. Wohner⁴; M. Mirtl⁴; R. Schima⁵; J. Bumberger²; S. Zacharias².

¹Helmholtz Centre For Environmental Research - UFZ; ²Helmholtz Centre for Environmental Research - UFZ; ³Senckenberg Research Institute and Natural History Museum; ⁴Environment Agency Austria; ⁵University of Rostock

13:45 Monitoring seasonal variation of observed soil moisture data at two experimental fields in the Alento hydrological observatory. P. Nasta¹; N. Romano¹; H. Bogena; H. Vereecken. ¹University of Napoli Federico II

14:00 Ecosystem integrity revised: how to increase its usability in assessing states of ecosystems? M. Frenzel¹; E. Groner²; F. Müller³. ¹Helmholtz Centre for Environmental Research - UFZ; ²Dead Sea and Arava Science Center; ³Kiel University

14:15 Short-term vs long-term signal of atmospheric deposition, spring and stream waters in a mountainous environment for the period 1986-2015 (Strengbach catchment, North eastern France). M.-C. Pierret¹; F. Delay²; L. Stromhenger³; S. Cotel⁴; D. Viville⁴; A. Probst⁵. ¹University of Strasbourg; ²CNRS - Université de Strasbourg; ³INRA; ⁴CNRS; ⁵Ecolab UMR

14:30 The impact of land use changes upon soil erosion and sediment yields. A 20-year monitoring project of the OZCAR research infrastructure. C. Valentin¹; O. Ribolzi²; G. Lacombe²; K. Oudone Latsachack¹; E. Mouche³; J. Patin³; A. de Rouw¹; N. Silvera¹; B. Soulileuth¹; O. Sengtaeauanghoun⁴.

¹Institut de Recherche pour le Développement; ²IWMI; ³Cea; ⁴DALaM

14:45 COSMOS-UK: challenges and achievements in establishing a soil moisture monitoring network in the UK. D. Boorman. Centre for Ecology & Hydrology
Remote Sensing and Ecosystem Services

I. Hajnsek¹², E. Borg¹, H. Jörg¹
¹German Aerospace Center (DLR), ²ETH Zürich

Recent advances in the development of radar as a tool for monitoring vegetation water dynamics
Prof. Susan Steele-Dunne Civil Engineering and Geosciences, TU Delft

Mapping vegetation parameters in pre-Alpine and Alpine grasslands – a field experiment to analyse the potential of UAV-borne multispectral sensors.
A. Schucknecht¹; A. Krämer; S. Asam; R. Kiese. ¹Karlsruhe Institute of Technology, Institute of Meteorology and Climate Research – Atmospheric Environmental Research (IMK-IFU), Garmisch-Partenkirchen

Assessment of water quality using remote sensing – interdisciplinary validation/calibration campaign at the regional scale.
J. Bumberger; K. Friese; A. Lausch; K. Rinke. Helmholtz Centre for Environmental Research (UFZ)

Performance analysis of different microwave radiative transfer models for soil moisture estimation over the Munich-North-Isar test-site.
T. Weiss; P. Marzahn. Ludwig-Maximilians-Universität München

Using machine learning to extract profiles of crop root water uptake from remote sensing data.
G. Lischeid¹; P. Rauneker²; J. Hufnagel². ¹ZALF, Institute of Landscape Hydrology; ²ZALF - Leibniz-Centre for Agricultural Landscape Research

A new hyperspectral radiometer integrated in automated networks of water and land bidirectional reflectance measurements for validation of optical remote sensing data - The H2020/HYPERNETS Project.
D. Spengler¹; K. Ruddick²; J. Kuusk³; V. Brando⁴; D. Doxaran⁵; A. Dogliotti⁶; R. Eliott⁷; N. Fox⁷; C. Giardino⁸; C. Goyens²; F. Grings⁶; L. Guanter¹; E. Leymarie⁵; T. Lillemaa³; C. Penkerc’h³; A. Reinart³; R. Santoleri⁹; K. Segl¹; D. Vanderzande²; Q. Vanhellemont²; R. Vendt³. ¹GeoForschungsZentrum GFZ; ²Royal Belgian Institute for Natural Sciences (RBINS); ³Tartu Observatory (TO); ⁴Consiglio Nazionale delle Ricerche (CNR); ⁵Laboratoire d’Océanographie de Villefranche-sur-Mer, CNRS Universitéé Paris VI; ⁶Instituto de Astronomía y Física del Espacio (IAFE), CONICET; ⁷National Physical Laboratory (NPL); ⁸CNR-IREA; ⁹CNR-ISAC

Evaluating the use of Cosmic-ray Probes in Validation of Satellite Soil Moisture Products.
M. Berk Duygu; Z. Akyürek. Middle East Technical University
Biodiversity Monitoring: Past, presence, future

S. Klotz  Helmholtz Centre for Environmental Research (UFZ)

10:00 Keynote
Biodiversity change across space and time using historic data and distributed networks.  Prof. Tiffany Knight
German Center for Integrative Biodiversity Research (iDiv), Halle-Jena-Leipzig

Orals 15:30
From Habitat Mapping to Plant Trait Characterization – A Scale Specific Perspective on Future Challenges for Biodiversity Monitoring.
C. Neumann¹; A. Schindhelm¹; D. Spengler¹; S. Itzerott¹; G. Weiss²; J. Müller³; M. Wichmann³. ¹Helmholtz Centre Potsdam, GFZ German Research Centre for Geosciences; ²ecostrat GmbH Berlin; ³Heinz Sielmann Foundation

15:45 Bee community patterns in agricultural landscapes – do they change in the long run and does it matter?  M. Frenzel¹; O. Schweiger¹.
¹Helmholtz Centre for Environmental Research - UFZ

16:00 A comparison of sampling methods for Apidae bees and Syrphidae flies.
A. Thompson¹; T. Knight². ¹Martin Luther University of Halle-Wittenberg; ²German Center for Integrative Biodiversity Research (iDiv), Halle-Jena-Leipzig

16:15 National biodiversity monitoring in Germany: The need for collaboration.
J. Geschke¹; N. Sommerwerk; K. Vohland; C. Häuser; M. Lutz.
¹Museum für Naturkunde - Leibniz Institut for Evolution and Biodiversity Science

16:30 Robust method of soil mesofauna assessment in urban environment for long-term ecological research.  V. Melecis; V. Grina; U. Kagainis; E. Jucevica; I. Salmane.
Institute of Biology, University of Latvia
Integration of in-situ and remote sensing data for the earth surface-atmosphere system

T. Sachs, S. Itzerott, D. Spengler
German Research Centre for Geosciences (GFZ)

11:00 Mapping evapotranspiration from flux tower and aircraft measurements – how so? Dr. Stefan Metzger
National Ecological Observatory Network (NSF-NEON), Boulder, US

15:30 Estimating Biophysical Crop Parameters Using Multitemporal Sentinel-1 and Sentinel-2 Data. K. Heupel¹; D. Spengler¹; C. Weltzien².
¹German Research Centre for Geosciences (GFZ); ²Leibniz Institute for Agricultural Engineering and Bioeconomy (ATB)

15:45 Data fusion for precision farming based on belief theory: Combination of satellite, soil and elevation data with evidential reasoning and expert knowledge. C. Vallentin¹; E. S. Dobers²; D. Spengler¹; S. Itzerott¹.
¹German Research Centre for Geosciences (GFZ); ²Hochschule Neubrandenburg

16:00 Drone based estimation of latent heat flux over different forest types. P. Marzahn¹; R. Ludwig; A. Sanchez-Azofeifa.
¹Ludwig-Maximilians-Universität München

16:15 Analysis of below forest soil moisture times-series data and Sentinel-1 C-band radar backscatter. C. Pathe¹; N. Salepci¹; C. Thiel²; C. Schmullius¹.
¹Friedrich-Schiller-University of Jena; ²German Aerospace Center (DLR)

16:30 Synergies for Soil Moisture Retrieval Across Scales from Airborne Polarimetric SAR, Cosmic-Ray Neutron Roving, and an In Situ Sensor Network. B. Fersch¹; T. Jagdhuber²; M. Schrön³; I. Völksch¹; M. Jäger².
¹Karlsruher Insitut für Technologie (KIT); ²German Aerospace Center (DLR); ³Helmholtz Centre for Environmental Research (UFZ)

16:45 The Use of Multi-temporal MODIS Satellite Data to Map Veld Fire Hazards in Limpopo Province, South Africa. F. Dondofema; T. Mudau; B. Odhiambo.
University of Venda
Innovative sensing methods for the critical zone

A1 River Platform for Monitoring Erosion (RIPE) in mountainous rivers. G. Nord¹; M. Esteves; Y. Michielin; R. Biron; T. Geay; A. Hauet; Hervé Denis. ¹Université Grenoble Alpes, CNRS, IRD, Grenoble-INP

A2 Estimating Infiltration-Induced Soil Water Content Changes using Combined Horizontal Borehole GPR and Dispersive Surface GPR data. Y. Yu¹; A. Klotzsche¹; D. Schmidt; J. Vanderborght¹; H. Vereecken¹; J. van d. Kruk¹. ¹Forschungszentrum Jülich

A3 Improvement of GPR FWI images using CPT data obtained at the Krauthausen testsite. Z. Zhou¹; J. Schmack; A. Klotzsche; N. Güting; P. Haruzi; H. Vereecken; J. van d. Kruk. ¹Forschungszentrum Jülich

A4 How can we characterize fault zones in the Critical Zone? Insights from three innovative hydromechanical standpoints. J. Schuite¹; L. Longuevergne²; O. Bour²; N. Lavenant³; Frédéric Boudin⁴. ¹Ecole des Mines de Paris - Mines ParisTech; ²Univ Rennes, CNRS, Géosciences Rennes – UMR; ³University Rennes; ⁴Ecole Normale Supérieure de Paris

A5 Offering a new soil moisture profile probe operating with Time Domain Transmission Technique. A. Zackiewicz¹; S. Trinks²; G. Wesssolek²; G. Kast³; T. Recke³; A. Szypłowska⁴; A. Wilczek⁴; M. Kafarski⁴; W. Skierucha⁴. ¹Technische Universität Berlin; ²Technical University of Berlin; ³UP Umweltanalytische Produkte GmbH; ⁴Bohdan Dobrzański Institute of Agrophysics

A6 New Sensor of Soil Moisture, Salinity and Temperature. X. Chavanne. IPGP

A7 Cosmic-ray neutron probes used for simultaneous soil moisture and biomass estimation. J. Jakobi; H. R. Bogena; J. A. Huisman; H. Vereecken. Forschungszentrum Jülich GmbH (IBG-3)

A8 Cosmic-Ray Neutron Rover Surveys of Field Soil Moisture and the Influence of Roads. S. Zacharias¹; R. Rosolem²; M. Köhli³; L. Piussi²; I. Schröter; J. Iwema²; S. Köglér³; S. Oswald³; U. Wollschläger³; L. Samaniego¹; P. Dietrich¹; M. Schrön¹. ¹UFZ-Helmholtz Centre for Environmental Research; ²University of Bristol; ³Heidelberg University; ⁴Free University of Bolzano-Bozen; ⁵University of Potsdam
A9 Detection of humus properties at forest stands using VIS-NIR spectroscopy. 
F. Thomas¹; U. Werban¹; C. Becker²; R. Petzold². 
¹UFZ Helmholtz Centre for Environmental Research (UFZ); ²Public Enterprise Sachsenforst

A10 Mapping of soil organic carbon at the field scale based on geophysical surveys and VNIR-spectroscopy. 
U. Werban¹; C. Bödinger²; P. Marco¹; M. Schneider³; K. Schmidt²; J. Bumberger¹. 
¹Helmholtz Centre for Environmental Research (UFZ); ²Eberhard Karls University Tübingen; ³Agricon GmbH

A11 Mass spectra of dissolved volatiles compounds as a fingerprint of water pathways. 
T. Labasque¹; E. Chatton²; A. Guillou²; V. Vergnaud²; L. Aquilina². 
¹CNRS - Geosciences Rennes; ²OSUR- University of Rennes

A12 Comparing alternative tracing measurements and mixing models: sediment fingerprinting in a meso-scale mediterranean catchment. 
M. Uber¹; C. Legout; G. Nord; C. Crouzet; F. Demory; J. Poulenard. 
¹Institut des Géosciences de l’Environnement

Long-term environmental observation – Advancing the understanding of Earth System in the Anthropocene

B1 The Huehnerwasser landscape observatory - monitoring dynamic ecosystem behavior. 
W. Gerwin; W. Schaaf; A. Badorreck. 
Brandenburg University of Technology Cottbus-Senftenberg

B2 Validation measurements for remote sensing based agricultural monitoring: Status update for the German JECAM site DEMMIN/TERENO-NE. 
D. Spengler¹; N. Ahmadian²; E. Borg³; C. Hüttich²; S. Itzerott¹; H. Maass³; K.-D. Missling³; C. Schmullius⁴; S. Truckenbrodt³⁴; C. Conrad²⁵. 
¹GeoForschungsZentrum GFZ; ²Universität Würzburg; ³Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR); ⁴Universität Jena; ⁵Universität Halle-Wittenberg

B3 OZCAR: the French network of Critical Zone Observatories. 
J. Gaillardet¹; I. Braud²; F. Harkard¹. 
¹IPG PARIS; ²IRSTEA Lyon

B4 Long-term measurements of land surface exchange by six eddy-covariance stations in two regions in Southwest Germany. 
T. Streck. 
University of Hohenheim
Remote Sensing and Ecosystem Services

C1  Estimating groundwater contribution to transpiration using satellite-derived evapotranspiration estimates coupled with stable isotope analysis.  
S. Gokool¹; E. Riddell²; A. Swemmer³; J. Nippert⁴; R. Raubenheimer; K. Chetty⁴.  
¹University of KwaZulu-Natal; ²South African National Parks; ³South African Environmental Observation Network; ⁴Kansas State University

C2  Intercomparison of albedo: MODIS, Landsat and in situ data on Livingston Island, Antarctica.  
A. Corbea-Pérez; J. F. Calleja; S. Fernández; C. Recondo; J. Peón.  
University of Oviedo

C3  Spatiotemporal cover factor analysis of large geographic region: coupling remotely sensed data with the integrated administration and control system data (INVEKOS).  
D. Ayalew¹; D. Deumlich²; B. Šarapatka³.  
¹Palacky University Olomouc; ²Leibniz Centre for Agricultural Landscape Research (ZALF); ³Palacky University Olomouc

C4  Characterizing Changes in Agricultural Soil and Vegetation using Polarimetric and Interferometric SAR – Status and Perspectives.  
H. Joerg¹; A. Alonso-González; I. Hajnsek.  
¹German Aerospace Center (DLR)

C5  Airborne Detection of Cosmic-Ray Albedo Neutrons for Regional-Scale Surveys of Root-Zone Soil Water.  
M. Schrön¹; L. Bannehr²; M. Köhli³; M. Zreda⁴; J. Weimar³; S. E. Oswald⁵; J. Bumberger¹; P. Zieger⁷; P. Dietrich¹; S. Zacharias¹.  
¹UFZ Leipzig; ²Hochschule Anhalt; ³Heidelberg University; ⁴University of Arizona; ⁵University of Potsdam; ⁷Fraunhofer-Institut für Kommunikation, Information und Ergonomie FKIE

C6  Urban land use intensity assessment: The potential of spatio-temporal spectral traits with remote sensing.  
T. Wellmann¹; D. Haase; S. Knapp; A. Lausch.  
¹Humboldt-Universität zu Berlin

C7  Field-scale grassland biomass estimation using 3D point cloud derived from UAV-borne images.  
J. Wijesingha; T. Moeckel; M. Wachendorf.  
Universität Kassel

C8  UAV-based photogrammetry: opportunities for maintenance and design of vineyard terrace landscapes.  
P. Tarolli¹; A. Pijl¹; T. Vogel².  
¹University of Padova; ²Cambisol BV
Coupling Deep Learning and GIS for forest damage assessment based on high-resolution remote sensing data. Z. Hamdi; M. Brandmeier¹; D. Straub²; M. Berk. ¹Esri Germany; ²Technische Universität München

Continent-wide analysis of mass changes from glaciers and ice caps using bi-static SAR data. M. Braun; P. Malz; T. Seehaus; C. Sommer; D. Farias. Universität Erlangen-Nürnberg

Integration of in-situ and remote sensing data for the earth surface-atmosphere system

An Automated Progressive Crop-Type Classification Using Multitemporal Remote Sensing Data and Phenological Information. K. Heupel; D. Spengler; S. Itzerott. GFZ German Research Centre for Geosciences

Hydrological applications and validation of EUMETSAT-H SAF soil moisture records using in-situ measurements for selected sites in Germany. P. Krahe; A. Kunkel. Bundesanstalt für Gewässerkunde (BfG)

Modelling evapotranspiration over heterogeneous landscapes using remote sensing and in situ data. C. Hohmann; D. Spengler; S. Itzerott; K. Heupel. GFZ German Research Centre for Geosciences

Regional estimates of surface heat and methane fluxes based on airborne eddy-covariance measurements. A. Serafimovich¹; J. Hartmann²; K. Kohnert¹; T. Sachs¹. ¹GFZ German Research Centre for Geosciences; ²Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research

Compact automatic Rotational Raman lidar system for continuous day- and nighttime temperature and humidity profiling. D. Lange Vega; A. Behrendt; S. Muppa; V. Wulfmeyer. University of Hohenheim
Trends and events in hydrosystems: a new multi-scale and cross-compartment observation approach deciphering controls and impacts of hydrological extremes

Prof. Dietrich Borchardt
UFZ Leipzig, Technical University of Dresden

Catchment storage estimation, dynamics and controls – Insights gained from a long-term monitoring programme in the nested catchment set-up of the Alzette River basin (Luxembourg)

Dr. habil. Laurent Pfister
Luxembourg Institute of Science and Technology

Beyond the mesoscale – new thinking about the role of time in water quality modelling

Prof. Martyn Futter
Swedish University of Agricultural Sciences

Greenhouse gas fluxes from Arctic tundra in a changing climate

Prof. Per Ambus
Geosciences and Natural Resource Management, Copenhagen University

Disentangling the decadal ‘knot’ in high-resolution paleoclimatology

Prof. Scott St. George
Department of Geography, Environment and Society, University of Minnesota, USA

Coffee break

Lunch
Decadal and centennial variability from high-resolution bio- and geoarchives

I. Heinrich¹, M. Wilmking², A. Brauer¹

¹German Research Centre for Geosciences (GFZ), ²University of Greifswald

11:30 Disentangling the decadal ‘knot’ in high-resolution paleoclimatology

Prof. Scott St. George  University of Minnesota, USA

13:30 Reconstructing past water table dynamics from small-scale buried depressions in NE Belgium: pedological, lithological and botanical evidence.

K. Beerten¹; W. van d. Meer²; A. Grade³; K. Hebinck⁴; M. Schurmans⁴. ¹Belgian Nucl. Research Centre (SCK-CEN); ²BIAX consult; ³ONDRAF/NIRAS; ⁴VUhbs archeologie

13:45 Synchronizing 10Be in two varved lake sediment records to IntCal13 14C during three grand solar minima.

M. Czymzik¹; R. Muscheler²; F. Adolphi;²³; F. Mekhaldi²; N. Dräger⁴; F. Ott⁴⁵; M. Slowinski⁶; M. Blaszkiewicz⁶⁷; A. Aldahan⁸; G. Possnert⁹; A. Brauer⁴. ¹Leibniz-Institute for Baltic Sea Research Warnemünde (IOW); ²Lund University; ³University of Bern; ⁴GFZ-German Research Centre for Geosciences; ⁵Max Planck Institute for the Science of Human History, Jena; ⁶Polish Academy of Sciences, Warszawa; ⁷Polish Academy of Sciences, Torun; ⁸United Arab Emirates University - UAR; ⁹Tandem Laboratory, Uppsala University

14:00 The influence of site, atmospheric depositions and disturbance history on trends and amplitudes of tree-ring based climate reconstructions – hints for a better calibration.

T. Scharnweber; J. E. Harvey; M. Trouillier; M. Wilmking.  University of Greifswald

14:15 Variability of arsenic concentration in Titisee sediments (Southern Black Forest, SW Germany) in response to Holocene forest development and human land-use impact.

L. Kämpf¹; R. Tjallingii²; E. Fischer³; T. Kasper⁴; T. Haberzettl⁵; K.-H. Feger¹; M. Rösch³. ¹TU Dresden; ²GeoForschungsZentrum GFZ Potsdam; ³Landesamt für Denkmalpflege Baden-Württemberg; ⁴Universität Jena; ⁵Universität Greifswald

14:30 Linking varve-formation processes to climate and limnological conditions at Lake Tiefer See (NE Germany).

N. Dräger¹; U. Kienel¹; B. Plessen¹; F. Ott¹²; B. Brademann¹; S. Pinkerneil¹; A. Brauer¹³. ¹GeoForschungsZentrum GFZ; ²Max Planck Institute for the Sciences of Human History, Jena; ³University of Potsdam

14:45 Improving land cover reconstructions with pollen data from annually laminated lake sediments.

M. Theuerkauf¹; J. Couwenberg¹; N. Dräger². ¹University of Greifswald; ²Helmholtz Centre Potsdam, GFZ German Research Centre for Geosciences
Improving water quality management using new observation and modeling strategies

M. Rode¹, G. Lischeid²

¹Helmholtz Centre for Environmental Research (UFZ),
²Leibniz Centre for Agricultural Landscape Research (ZALF)

Beyond the mesoscale – new thinking about the role of time in water quality modelling

Prof. Martyn Futter    Swedish University of Agricultural Sciences

What and where do we need to measure to predict future nitrate concentrations?

C. Vautier¹; R. Abherve¹²; T. Kolbe³; T. Babey; J. Marçais¹²; C. Petton¹²; T. Labasque¹²; A. Guillou¹²; E. Chatton³; A. Gauvain¹²; B. Abbott; A. Laverman¹⁴; L. Aquilina¹²; G. Pinay⁵; J.-R. de Dreuzy².    ¹Université de Rennes; ²CNRS, Géosciences Rennes – UMR; ³Swedish University of Agricultural Sciences, Uppsala; ⁴CNRS, Ecobio; ⁵IRSTEA Lyon

Innovative field continuous characterisation of groundwater biogeochemical reactivity using an integrated approach.

E. Chatton; L. Bethencourt¹; L. Aquilina¹; A. Dufresne²; E. Petelet-Giraud³; T. Labasque²; A. Guillou¹; F. Koch³.    ¹Université de Rennes; ²CNRS; ³BRGM

Does LiDAR-derived information on drainage ditches improve the modelling of water runoff and nitrate loading in agricultural catchments?

J. Roelens¹; S. Dondeyne¹; J. Van Orshoven¹; J. Diels¹.    ¹KU Leuven

In-stream nitrate uptake at river network scale: Integrating high frequency sensor monitoring and catchment modeling.

X. Yang; S. Jomaa; M. Rode.    Helmholtz Centre for Environmental Research (UFZ)

Hindcasting land use change impacts on the hydrologic and geochemical processes of Koiliaris CZO.

D. Efstathiou; N. Nikolaidis.    Technical University of Crete

Decadal trajectories of nitrate input and output in three nested catchments along a land use gradient.

S. Ehrhardt¹; A. Musolff; R. Kumar; S. Attinger; J. Fleckenstein.    ¹Helmholtz-Centre for Environmental Research (UFZ)
Management and integration of environmental observation data

R. Kunkel
Forschungszentrum Jülich

13:30 Implementing WADI – A Spatial Data Infrastructure for data on climate change and adapted land use in West Africa. 
A. Rogmann²; R. Kunkel¹; J. Sorg¹. ¹Institute for Bio and Geosciences - Agrosphere, Research Centre Jülich GmbH; ²Center of Development Research, University of Bonn

13:45 Building the Information system of the French OZCAR Critical Zone observatory network. S. Galle¹; C. Coussot²; V. Chaffard¹; P. Juen¹; I. Braud³. ¹Université Grenoble Alpes, CNRS, IRD, Grenoble-INP; ²Université Grenoble Alpes, CNRS, IRD, Météo-France, Irstea; ³IRSTEA

14:00 MOSES Data Management Platform – Concept and first steps towards implementation. D. Kerschke; H. Fuchs; M. Hammitzsch. GFZ German Research Centre for Geosciences, eScience Centre

14:15 ICOS Carbon Portal: a one-stop shop for European greenhouse gas data. M. Hellstrom. Lund University

14:30 Biodiversity data integration: Current practices and challenges in Germany. J. Geschke¹; A. Mascarenhas; K. Vohland; C. Häuser. ¹Museum für Naturkunde - Leibniz Institut for Evolution and Biodiversity Science

14:45 Discovery and access of time series data from long term monitoring – a mission impossible? J. Peterseil¹; C. Wohner¹; A. Oggioni²; V. Minic³; R. Kunkel⁴; J. Watkins⁵. ¹Environment Agency Austria; ²Consiglio Nazionale delle Ricerche; ³BioSense Institute (BSI); ⁴Research Centre Jülich GmbH; ⁵Centre of Ecology and Hydrology (CEH)
Measuring and modeling water storage dynamics

A. Güntner, T. Blume
German Research Centre for Geosciences (GFZ)

Keynote 9:30
Catchment storage estimation, dynamics and controls – Insights gained from a long-term monitoring programme in the nested catchment set-up of the Alzette River basin (Luxembourg)
Dr. habil. Laurent Pfister Luxembourg Institute of Science and Technology

Orals 15:30
Hydro-gravimetry as a tool to constrain water mass transfer in catchments. Example from the Strengbach Catchment in the Vosges mountains, France.
Q. Chaffaut¹; J. Hinderer²; F. Masson²; M.-C. Pierret³; D. Viville³.
¹University of Strasbourg; ²EOST, University of Strasbourg, France; ³UMR; ⁷Laboratoire d’Hydrologie et de GÉochimie de Strasbourg

Spatially explicit mapping of the effect size of soil hydrological processes in a forested headwater catchment.
G. Lischeid¹; H. Bogena².
¹ZALF, Institute of Landscape Hydrology; ²Forschungszentrum Jülich GmbH

Dynamic response patterns of profile soil moisture under different land covers in the Mountainous area of the Heihe River Watershed, Northwest China.
J. Tian¹; B. Zhang; C. He; Z. Han; H. Bogena; J. Huisman.
¹Forschungszentrum Jülich

Quantifying the regional groundwater/surface water interaction based on 18O and Deuterium.
C. Merz¹; G. Lischeid¹; S. Vyse; C. Acame¹.
¹Leibniz Centre for Agricultural Landscape Research (ZALF)

High resolution isotope data and ensemble modelling to investigate water storage and flux dynamics.
D. Tetzlaff; A. Smith; S. Kuppel; A. Douinot; C. Soulsby.
University of Aberdeen

Water storage dynamics during 12 years of ecological development in the Chicken Creek catchment.
W. Schaaf¹; I. Pohle²; T. Maurer³; W. Gewin¹; C. Hinz¹; A. Badorreck¹³. ¹BTU Cottbus - Senftenberg; ²The James Hutton Institute; ³Forschungszentrum Landschaftsentwicklung und Bergbaulandschaften (FZLB)
Novel approaches to monitor dynamic events

U. Weber¹, M. Mauder²

¹Helmholtz Centre for Environmental Research (UFZ)
²Karlsruher Insitut für Technologie (KIT)

9:00 Trends and events in hydrosystems: a new multi-scale and cross-compartment observation approach deciphering controls and impacts of hydrological extremes

Prof. Dietrich Borchardt  
UFZ; Technical University of Dresden

15:30 MOSES: a novel observing system for dynamic events.

U. Weber; Moses Team.  
Helmholtz Centre f. Environm. Research (UFZ)

15:45 TERENO-Data and Results as a basis for Helmholtz-MOSES Initiative from a hydrologic view.

R. Krieg; M. Huber; T. Rödiger; C. Müller; K. Knöller; R. Merz; S. Geyer.  
Helmholtz Centre for Environmental Research (UFZ)

16:00 Highly resolved radar measurements of precipitation events in an urban environment.

J. Handwerker; Y. Zheng; N. Kalthoff.  
Karlsruhe Institute of Technology (KIT)

16:15 Evaluation of energy balance closure adjustment methods by independent evapotranspiration estimates from lysimeters and hydrological simulations.

M. Mauder¹; S. Genzel; J. Fu; R. Kiese; M. Soltani; R. Steinbrecher; M. Zeeman; T. Banerjee; F. De Roo; H. Kunstmann.  
¹Karlsruhe Institute of Technology (KIT)

16:30 Conceptual framework of building linkages between tree-ring records, remote sensing images, and eddy-flux measurements: for understanding forest resilience to warming climate and predicting forest fate in next 100 years.

C. Yi; P. Xu; W. Fang; T. Zhou; G. Hendrey.
Biogeochemical processes in soil-plant-atmosphere systems

N. Brüggemann
Forschungszentrum Jülich

Keynote 11:00
Greenhouse gas fluxes from Arctic tundra in a changing climate
Prof. Per Ambus
Geosciences and Natural Resource Management, Copenhagen University

Orals 15:30
Soil organic carbon in savannas decreases with anthropogenic climate change.
K. Dintwe¹; G. S. Okin². ¹Botswana Institute for Technology Research and Innovation; ²University of California Los Angeles

Drought response of soil CO2 - emissions and -profile dynamics in current and future climate.
D. Reinthaler¹; E. Pötsch²; M. Herndl²; M. Bahn¹. ¹University of Innsbruck, Institute of Ecology; ²HBLFA Raumberg-Gumpenstein

Alternative mechanisms of decomposition – an array of emerging mechanisms that degrade organic matter when the climate gets warmer and drier.
J. Grünzweig¹; D. Gliksman. ¹Hebrew University of Jerusalem

On the connectivity between management, species composition and productivity of temperate upland grasslands.
M. Zeeman¹; H. Shupe²; C. Baessler³; N. Ruehr¹. ¹Karlsruhe Institute of Technology; ²University of Hamburg; ³Helmholtz Centre for Environmental Research (UFZ)

The Land-Atmosphere Feedback Experiment (LAFE): First results and future research activities.
V. Wulfmeyer¹; D. D. Turner². ¹University of Hohenheim; ²National Oceanic and Atmospheric Administration (NOAA)

Measurement and modeling nitrous oxide fluxes in complex cropland ecosystems.
C. Thieme¹; F. Heinlein; E. Priesack. ¹Helmholtz Zentrum München
Decadal and centennial variability from high-resolution bio- and geoarchives

F1 Temperature variation across lowland Europe during the last millennium reconstructed from wood anatomy of Quercus robur. D. Balanzategui¹; K.-U. Heußner²; T. Wazny³; G. Helle¹; R. L. Peters⁴; I. Heinrich¹. ¹German Centre for Geoscience GFZ; ²German Archaeology Institute, Berlin; ³University of Arizona, Tree-Ring Laboratory; ⁴Swiss Federal Inst. for Forest, Snow and Landscape Research (WSL)

F2 RAPTOR: Row and position tracheid organizer in R. R. L. Peters; D. Balanzategui¹; A. G. Hurley; G. von Arx; A. L. Prendin; C. Henri E.; J. Björklund; D. C. Frank; P. Fonti. ¹German Research Centre for Geosciences (GFZ)

F3 Climate-Growth Relations of Trees affected by the Urban Heat Island in Berlin. S. Schneider¹; S. Elsholz¹; B. Neuwirth²; I. Heinrich³; D. Balanzategui³; C. Schneider¹. ¹Humboldt-Universität zu Berlin; ²DeLaWi-TreeRing Analyses; ³German Research Centre for Geosciences (GFZ)

F4 Hydroclimate signals derived from historical construction timber of Boitzenburg palace in north-eastern Germany. G. Helle¹; D. Balanzategui¹; K.-U. Heußner³; I. Heinrich¹⁴. ²German Archaeological Institute DAI, Berlin; ³German Research Centre for Geosciences (GFZ)

F5 Analyzing stable isotope composition of lake water (δ18O, δD) at Lake Tiefer See Klocksin (NE-Germany) to better understand calcium carbonate precipitation processes. S. Pinkerneil¹; B. Plessen. ¹German Research Centre for Geosciences (GFZ)

F6 Geogenic vs anthropogenic heavy metal enrichment in Lake Tiefer See, Germany. P. Hoelzmann. Freie Universität Berlin

F7 Detecting dynamical landscape responses to hydrological extreme events in lacustrine sediments. A. Ramisch; R. Tjallingii; L. Schley; A. Brauer. German Research Centre for Geosciences (GFZ)

F8 Impact of abiotic stress factors on cell wall thickness and lumen area of earlywood and latewood of spruce (picea abies (L.) karst) in ore mountains. M. Lexa¹; A. Zeidller²; M. Vejpustková³. ¹Czech University of Life Sciences; ²Czech University of Life Sciences Prague; ³Forestry and Game Management Research Institute, v.v.i
Improving water quality management using new observation and modeling strategies

**G1** Impact of a partial forest harvesting on fluxes of suspended sediment and bedload in the small granitic Strengbach catchment (Vosges massif, France). S. Cotel¹; D. Viville¹; M. C. Pierret¹; S. Benaroumlil. ¹Lhyges

**G2** Tomography of anthropogenic nitrate contribution along the Holtemme River within the TERENO Bode catchment, Germany. C. Müller; A. Musolff; U. Strachauer; M. Brauns; L. Tarasova; R. Merz; K. Knöller. Helmholtz Centre for Environmental Research (UFZ)

**G3** Spatial evaluation of the water quality catchment model HYPE in the Selke catchment, central Germany. S. Ghaffar; S. Jomaa; M. Rode. Helmholtz Centre for Environmental Research (UFZ)

**G4** Occurrence of microplastic particles in a watercourse surveyed by a novel fast detection method. L. K. Schmidt¹; S. E. Oswald¹; M. Bochow². ¹University of Potsdam; ²German Research Centre for Geosciences (GFZ)

**G5** Study of hydrological and hydrochemical interactions to evaluate the hydrograph separation. J. Tunqui¹; J.-M. Mouchel; G. Tallec; V. Andréassian. ¹IRSTEA - UMR TETIS

**G6** The influence of stream geomorphology on nutrient retention at river network scale. X. Zhou; S. Jomaa; M. Rode. Helmholtz Centre for Environmental Research (UFZ)
Measuring and modeling water storage dynamics

11 Estimation of groundwater recharge to a carbonate aquifer for semi-arid climates by integrated surface-subsurface, multi-continuum hydrogeological modelling.  
\[ \text{Author(s): L. Bresinsky}^{1}; J. Kordilla}^{1}; M. Sauter}^{1}. \]
\[ ^{1}\text{Georg-August Universität Göttingen} \]

12 Vadose Zone Modeling in a Small Forested Catchment: Impact of Water Pressure Head Sampling Frequency on 1D-Model Calibration.  
\[ \text{Author(s): B. Belfort}^{3}; I. Toloni; P. Ackerer; S. Cotel; D. Viville; F. Lehmann. \]
\[ ^{3}\text{University of Strasbourg} \]

13 Seismic monitoring of an alluvial aquifer during a pumping test.  
\[ \text{Author(s): S. Pasquet}^{1}; L. Bodet}^{2}; F. Robustelli}^{3}; M. Dangeard}^{2}; L. Longuevergne}^{3}; O. Bour}^{3}. \]
\[ ^{1}\text{Institut de Physique du Globe de Paris}; ^{2}\text{Sorbonne Université, UMR METIS}; ^{3}\text{Université de Rennes 1, CNRS, UMR Géosciences Rennes} \]

14 Soil water characteristics of a mineral landfill capping system determined by in situ measurement techniques.  
\[ \text{Author(s): S. Beck-Broichsitter}^{1}; H. H. Gerke}^{1}; R. Horn}^{2}. \]
\[ ^{1}\text{Leibniz Centre for Agricultural Landscape Research (ZALF)}; ^{2}\text{Institut für Pflanzenernährung und Bodenkunde, Christian-Albrechts-Universität zu Kiel} \]

15 Integrative monitoring of water storage variations with terrestrial gravimetry.  
\[ \text{Author(s): A. Güntner}^{1}; M. Reich; M. Mikolaj; T. Blume; S. Schröder. \]
\[ ^{1}\text{German Research Centre for Geosciences (GFZ)} \]

16 Water retention dynamics of erosion-affected Luvisols in weighing lysimeters from a hummocky soil landscape.  
\[ \text{Author(s): H. H. Gerke}^{1}; M. Herbrich. \]
\[ ^{1}\text{Leibniz Centre for Agricultural Landscape Research (ZALF)} \]

17 Response patterns in throughfall and stemflow: a high-resolution data set covering different forest stands.  
\[ \text{Author(s): L. Schneider; J. Dreibrodt; A. Güntner; T. Blume.} \]
\[ ^{1}\text{German Research Centre for Geosciences (GFZ)} \]
Biogeochemical processes in soil-plant-atmosphere systems

K1 Nutrient (Ca, Mg, K) behavior in soils located in decline forest (Strengbach catchment, Vosges Mountain, NE France). Development of a new experimental approach.  

M. Oursin¹; M.-C. Pierret¹; A. Legout²; B. Zeller².  
¹Laboratoire d’Hydrologie et de Géochimie (LHyGeS), Université de Strasbourg; ²INRA de Nancy

K2 Chemical and isotopic variability in tree sap in temperate forests during the leaf-out period: a case study in the experimental Weierbach catchment, Luxembourg.  

C. Hissler; L. Gourdol; L. Pfister.  
Luxembourg Inst. of Science and Technology

K3 On the potential of redox potential measurements for the characterization of greenhouse gas emissions.  

J. Wang; H. Bogena; H. Vereecken; N. Brüggemann.  
Forschungszentrum Jülich/IBG-3

K4 Modelling climate change impact on N2O emissions from agricultural soils.  

E. Priesack.  
Helmholz-Zentrum München

K5 Vertical distribution of oxygen in aquifers: a hint of reactive zones?  

C. Bouchez¹; T. Labasque¹; J. Farasin²; O. Bochet²; L. Aquilina²; J. R. de Dreuzy¹; T. Le Borgne².  
¹CNRS; ²University Rennes
Relevance of soils in terrestrial matter fluxes — measurements and model concepts

L1 Are we able to monitor temporal changes in forest soil properties in Flanders?  
N. Cools; B. De Vos.  
Research Institute for Nature and Forest (INBO)

L2 Are the material concentrations measured in the leachate tank and in the bypass collection flask of TERENO SoilCan Lysimeters comparable?  
H. Rupp¹; R. Gründling; H.-J. Vogel.  
¹Helmholtz Centre for Environmental Research (UFZ)

L3 Quantifying the effects of modelled soil hydraulic properties on simulated crop growth over the entire moisture range.  
S. Gayler¹; T. K. D. Weber; F. Mequanint¹; T. Streck¹.  
¹University of Hohenheim

Model-data fusion: Improving predictions and improving process understanding

M1 Comparison of observed soil moisture with simulations of the operational German Drought Monitor.  
A. Marx; M. Schrön; S. Attinger; S. Zacharias; R. Leucht; C. Rebmann; L. Samaniego.  
Helmholtz Centre for Environmental Research (UFZ)
**Soil greenhouse gas exchange – Linking methods, bridging scales**

**O1** Evolution of the atmospheric carbon fluxes of a formerly drained fen up to the 13th year after rewetting. **E. Sachs**¹; **C. Wille**³; **F. Koebsch**²; **P. Gottschalk**¹. ¹GFZ German Research Centre for Geosciences, Telegrafenberg; ²Landscape Ecology, University of Rostock

**O2** N trace gas emissions and nitrate leaching from montane grasslands differing in climate and management. **R. Kiese**¹; **K. Petersen**¹; **R. Gasche**¹; **M. Zistl-Schlingmann**³; **H. Lu**¹; **J. Fu**¹; **K. Butterbach-Bahl**¹; **M. Dannenmann**¹; **B. Wolf**¹. ³Karlsruhe Institute of Technology, Institute of Meteorology and Climate Research, Garmisch-Partenkirchen

**O3** EC-PeT – a modern eddy-covariance software based on EC-PACK. **C. Drüe.** University of Trier

---

**Modeling the Hydrological System – Balancing of complexity and Uncertainty**

**P1** One-way coupling between MODFLOW models to simulate long-term groundwater-induced flooding at the catchment-scale with high spatial resolution. **E. Laloy; B. Rogiers; M. Gedeon; K. Beerten.** Belgian Nuclear Research Centre (SCK-CEN)

**P2** Reducing uncertainties in physically based modelling at regional scales from CZO local observations. **B. Hector¹; A. Depeyre²; S. Galle¹; C. Peugeot³; J.-M. Cohard²; L. Séguis³.** ¹IRD IGE; ²University Grenoble Alpes; ³IRD

**P3** Estimation of the uncertainty of the hydrologic predictions due to climate change at the Koiliaris Critical Zone Observatory. **S. Nerantzaki; N. P. Nikolaidis.** Technical University of Crete

**P4** Combined hydrological and geochemical modeling approach to understand the spatio-temporal variability of surface water chemistry. **J. Ackerer; B. Jeannot; François Chabaux; F. Delay; D. Viville; Y. Lucas.** Laboratoire D’Hydrologie et de Géochimie de Strasbourg (LHyGeS), CNRSUniversité de Strasbourg, France
Conference Dinner

The dinner takes place in the restaurant "Umspannwerk-Ost", a 5 minutes walk from the conference venue.

**Umspannwerk-Ost**
Palisadenstr. 48
10243 Berlin

The dinner registration fee is 60 € and includes meals/buffet and free drinks for 3 hours.
Thursday

Keynotes

9:00  The ecotron as controlled surrogate for reality. Too good to be true?

Professor Sarah Garré

Gembloux Agro-Bio Tech, Université de Liège, France

9:30  Experiences with multivariate data assimilation in integrated groundwater – surface water hydrological modelling

Dr. Henrik Madsen

Head of Innovation, Danish Hydraulic Institute, Denmark

10:00 Modelling the meso-scale: informing model structure from data analysis

Dr. Fabrizio Fenecia

Eawag - Swiss Federal Institute of Aquatic Science and Technology

10:30 Coffee break

11:00 Combining experiments, monitoring and modelling to understand and predict nutrient fluxes in temperate ecosystems

Professor Markus Weiler

Institute of Hydrology, Freiburg University

11:30 The need to combine different methods to understand ecosystem greenhouse gas exchange: a grassland case study

Dr. Lutz Merbold

Mazingira Centre, International Livestock Research Institute (ILRI), Nairobi, Kenya

12:00 Lunch
Relevance of soils in terrestrial matter fluxes – measurements and model concepts

H.-J. Vogel¹, J. Vanderborght²
¹Helmholtz Centre for Environmental Research (UFZ), ²Forschungszentrum Jülich

Combining experiments, monitoring and modelling to understand and predict nutrient fluxes in temperate ecosystems

Prof. Markus Weiler
Institute of Hydrology, Freiburg University

Geochemical characterization of karstic, groundwater and surface runoff at koiliaris critical zone observatory.

M. Lilli; N. Nikolaidis.
Technical University of Crete

Using sap flow data to parameterize the Feddes water stress model for Norway spruce.

I. Rabbel¹; H. Bogena²; B. Neuwirth³; B. Diekkrüger¹.
¹University of Bonn; ²Research Centre Jülich; ³DeLaWi-TreeRing Analyses

Impact of water-table dynamics on the destabilization of soil organic matter in a temperate agricultural catchment.

L. Jeanneau¹; P. Buysse²; M. Denis¹; P. Petitjean¹; G. Gruau¹; C. Flechard²; V. Viaud².
¹Univ Rennes, CNRS, Géosciences Rennes – UMR; ²INRA, Agrocampus Ouest, UMR SAS

Constraining a complex biogeochemical model for CO2 and N2O emission simulations from various land uses by model-data fusion.

T. Houska¹; D. Kraus²; R. Kiese²; L. Breuer¹³.
¹ILR, iFZ, Justus Liebig University Giessen; ²Institute of Meteorology and Climate Research - Atmospheric Environmental Research (IMK-IFU), Garmisch-Partenkirchen; ³Centre for International Development and Environmental Research (ZEU), Justus Liebig University Giessen, Giessen

Landscape-scale soil modelling: Domain knowledge and powerful algorithms.

M. Ließ.
Helmholtz Centre for Environmental Research - UFZ
Model-data fusion: Improving predictions and improving process understanding

H.-J. Hendricks-Franssen
Forschungszentrum Jülich

Experiences with multivariate data assimilation in integrated groundwater – surface water hydrological modelling

Dr. Henrik Madsen  Head of Innovation, Danish Hydraulic Institute, Denmark

Estimating and understanding model bias in simulating the diurnal cycle of evapotranspiration.

M. Renner¹; C. Brenner²; K. Mallick³; H.-D. Wizemann⁴; L. Conte⁵; I. Trebs⁶; J. Wei⁷; V. Wulfmeyer⁸; K. Schulz⁹; A. Kleidon⁵.

¹Max-Planck-Institute for Biogeochemistry Jena; ²Universität für Bodenkultur Wien; ³Luxembourg Institute of Science and Technology (LIST); ⁴University of Hohenheim; ⁵Max-Planck-Institute for Biogeochemistry; ⁶BOKU, University of Natural Resources and Life Sciences Vienna

Knowledge Fusion in Soil Hydrology.

H. H. Bauser¹²; D. Berg¹;²; K. Roth¹³.

¹Institute of Environmental Physics (IUP), Heidelberg University; ²HGS MathComp, Heidelberg University; ³Interdisciplinary Center for Scientific Computing (IWR), Heidelberg University

Forecasting water levels for the German waterways of the Rhine River using artificial neural networks and physically based models.

Y. Ma¹; E. Matta¹; D. Meißner²; J. Richter²; H. Schellenberg³; R. Hinkelmann¹.

¹Technische Universität Berlin; ²Bundesanstalt für Gewässerkunde; ³BearingPoint GmbH

Lithological Classification Based on Convolutional Neural Networks using multi-sensor data.

Y. Chen; M. Brandmeier¹.

¹Esri Germany

Linking in-situ observational networks and models to improve our understanding of the critical zone dynamics. The IR-OZCAR French contribution.

F. Habets¹; S. Anquetin²; I. Braud³; OZCAR modelling community.

¹CNRS, Sorbonne University; ²Université Grenoble Alpes and CNRS; ³IRSTEA Lyon

Data assimilation studies for the tereno rur catchment.

H.-J. Hendricks-Franssen¹; R. Baatz; H. Post; W. Kurtz; S. Gebler; H. Zhang; S. Kollet; H. Vereecken.

¹Forschungszentrum Jülich
Ecotrons and lysimeters: complementary tools for observation and experimentation on the critical zone

T. Pütz¹, H. Gerke²
Forschungszentrum Jülich, ²Leibniz Centre for Agricultural Landscape Research (ZALF)

9:00 The ecotron as controlled surrogate for reality. Too good to be true?
Prof. Sarah Garré Gembloux Agro-Bio Tech, Université de Liège, France

13:30 Water productivity of permanent grassland under changing climatic conditions – first results.
M. Herndl¹; V. Slawitsch²; E. Pötsch¹; A. Schaumberger¹. ¹AREC Raumberg-Gumpenstein; ²University of Graz

13:45 Impacts of different groundwater management regimes on water balance components of shallow groundwater table sites investigated with groundwater lysimeters.
O. Dietrich¹; M. Fahle²; T. Kaiser¹; J. Steidl¹. ¹Leibniz-Centre of Agricultural Landscape Research (ZALF) e.V.; ²Federal Institute for Geosciences and Natural Resources (BGR)

14:00 Responses of soil water storage and crop water use efficiency to climate change.
J. Groh¹; T. Pütz²; J. Vanderborght²; H.-J. Vogel³; R. Gründling³; H. Rupp³; M. Sommer¹; H. Vereecken²; H. H. Gerke¹. ¹Leibniz Centre for Agricultural Landscape Research (ZALF); ²Forschungszentrum Jülich GmbH; ³Helmholtz Centre for Environmental Research (UFZ)

14:15 Comparative study of a long-established large weighing lysimeter and a state-of-the-art mini-lysimeter.
C. Ruth; D. Michel; M. Hirschi; S. I. Seneviratne. Swiss Federal Institute of Technology Zurich (ETH Zurich)

14:30 Lysimeters – an indispensable tool for aquifer scaled numerical modeling.
J. Fank; G. Klammler; H. Kupfersberger. JR-AquaConSol Ltd.

14:45 From climate change to weather conditions: linking ecotrons to an ecosystem measurement tower to better simulate the effect of climate change on ecosystem functioning.
N. Beenaerts¹; I. Janssens²; J. Clerinx³; P. Steegen³; M. Roland²; N. Arriga²; I. Vanderkelen³; R. Ceulemans²; W. Thiery³; J. Vangronsveld³; F. Rineau¹. ¹Universiteit Hasselt; ²Universiteit Antwerp; ³Vrije Universiteit Brussel
Ecotrons and lysimeters: complementary tools for observation and experimentation on the critical zone

T. Pütz¹, H. Gerke²
¹Forschungszentrum Jülich, ²Leibniz Centre for Agricultural Landscape Research (ZALF)

Mobilization and transfert of pac (polycyclic aromatic compounds): laboratory and lysimeter column experiments. P. Faure¹; M. Boulangé¹; L. Maurcie¹; C. Lorgeoux²; C. Biache¹; N. Enjelvin³; J. Michel¹⁴; R. Michels².
¹LIEC UMR CNRS UL GISFI; ²GeoRessources UMR CNRS UL CREGU - GISFI; ³GISFI; ⁴INERIS

Long term fate of multi-contamination within the context of natural attenuation and climatic conditions: a collaborative study in TERENO and GISFI lysimeters. C. Leyval¹; T. Beguiristain¹; N. Enjelvin²; P. Faure¹; C. Lorgeoux¹; T. Pütz³.
¹CNRS; ²GISFI; ³Forschungszentrum Jülich GmbH

Water and coupled N fluxes at grassland lysimeters as subject to management and climate regime. K. Schneider¹; J. Fu; R. Gasche¹; R. Kiese¹; K. Butterbach-Bahl¹.
¹Karlsruhe Institute of Technology KIT

Lysimeter meets good agricultural practice – set up for monitoring pesticide movement through soils. M. Lesch¹; H. Pagel²; P. Grathwohl¹; T. Streck².
¹Universität Tübingen; ²University of Hohenheim;

Spatiotemporal variability of water and solute fluxes of a grassland site effected by climate change. N. Knauer¹; J. Groh²; H. Vereecken¹; E. Matzner³; T. Pütz¹.
¹Forschungszentrum Jülich GmbH (IBG-3); ²Leibniz Centre for Agricultural Landscape Research (ZALF); ³University of Bayreuth Germany
Soil greenhouse gas exchange – Linking methods, bridging scales

R. Kiese¹, E. Priesack², T. Sachs³

¹Karlsruher Institut für Technologie (KIT), ²Helmholtz Zentrum München (HMGU), ³German Research Centre for Geosciences (GFZ)

11:30 The need to combine different methods to understand ecosystem greenhouse gas exchange: a grassland case study

Dr. Lutz Merbold    Mazingira Centre, International Livestock Research Institute (ILRI), Nairobi, Kenya

15:30 Using isotopes to trace the effects of drought and rewetting on nitrous oxide emission pathways in a managed grassland.

E. Harris; M. Bahn.    University of Innsbruck

15:45 The long-term development of atmospheric CO2 and CH4 exchange in a rewetted peatland – synthesis from an interdisciplinary multi-year approach.

F. Koebsch¹; V. Unger¹; X. Wen²; S. Liebner²; T. Sachs²; M. Koch³; J. Hahn¹; G. Jurasinski¹.    ¹University of Rostock; ²GFZ German Research Centre for Geosciences; ³University of Götingen

16:00 GHG emission inventories from rice production systems in Asia.

D. Kraus¹; C. Werner²; B. Janz¹; T. Van Mai³; K. Butterbach-Bahl¹.    ¹Karlsruhe Institute of Technology, Institute of Meteorology and Climate Research, Garmisch-Partenkirchen; ²Senckenberg Biodiv. and Climate Research Centre (BiK-F); ³Vietnam Academy for Agricultural Sciences

16:15 The isotopic composition of N cycle species as a constraint for biogeochemical models.

B. Wolf¹; T. Denk¹; E. Ibraim²; J. Mohn²; D. Kraus¹; R. Kiese¹; K. Butterbach-Bahl¹.    ¹Karlsruhe Institute of Technology, Institute of Meteorology and Climate Research, Garmisch-Partenkirchen; ²Senckenberg Biodiversity and Climate Research Centre (BiK-F); ³Vietnam Academy for Agricultural Sciences; ²Empa, Swiss Federal Laboratories for Materials Science and Technology, Laboratory for Air Pollution / Environmental Technology, Dübendorf, Switzerland

16:30 Soil N2O and CH4 emissions from a subtropical montane agricultural landscape of Southwest China.

M. Zhou¹; B. Zhang¹; X. Wang¹; Y. Wang¹; B. Zhu¹.    Key Laboratory of Mountain Surface Processes and Ecological Regulation, Institute of Mountain Hazards and Environment, Chinese Academy of Sciences; Chengdu, China
Modeling the Hydrological System – Balancing of complexity and Uncertainty

S. Attinger
Helmholtz Centre for Environmental Research (UFZ)

Modelling the meso-scale: informing model structure from data analysis
Dr. Fabrizio Fenecia
Eawag - Swiss Federal Institute of Aquatic Science and Technology

Global sensitivity analysis for field-scale pathogen transport in natural aquifers to reduce model complexity.
D. Knabe¹; A. Guadagnini²; M. Riva²; H.-P. Rohns³; I. Engelhardt¹. ¹TU Berlin; ²Politecnico di Milano; ³Stadtwerke Düsseldorf

When does model complexity pay off? A case study for groundwater modelling.
T. Houben¹; G. de Rooij¹; S. Attinger¹. ¹Helmholtz Centre for Environmental Research (UFZ)

Application of a low-dimensional integrated model at the catchment scale – case study of the Strengbach catchment.
S. Weill¹; B. Jeannot; F. Delay. ¹Laboratory of Hydrology and Geochemistry of Strasbourg

A terrestrial climatology over Europe applying the Terrestrial Systems Modeling Platform, TerrSysMP.
S. Kollet¹; C. Furusho¹; K. Goergen¹; J. Keune²; K. Kulkarni¹; B. Naz¹; W. Sharples¹. ¹Research Centre Jülich; ²Gent University

Comparing hydrological drought representation in three hydrological models.
L. Melsen¹; B. Guse². ¹Wageningen University; ²German Research Center for GeoSciences - GFZ

Frequency-domain analysis of hydrological variables: a novel approach to better constrain factors controlling climatic signal transformation by hydrosystems.
J. Schuite¹; N. Flipo¹; A. Rivière¹; N. Massei². ¹Ecole des Mines de Paris - Mines ParisTech; ²Université de Rouen-Normandie
Geophysical Equipment for Soil Science
and Hydrogeological Applications
GPR / ERT / FD-EM / Cosmic Ray / NMR

Sales – Rentals – Repairs – Training – Research
Please contact us: www.allied-germany.de / Tel.: +49-2861-8085 648

ecoTech Umwelt-Meßsysteme GmbH
Nikolausstraße 7, D-53129 Bonn
T +49(0) 228 85 044 7700
ecoTech@ecoTech-Bonn.de

35 Years of ecoTech – Innovation and Competence
For 35 years we have developed, produced and supplied measuring and monitoring systems for water – soil – air.

www.ecotech-bonn.de

HYDROLOGY  ECOLOGY  SOIL SCIENCE  METEOROLOGY  MONITORING
Excursions

Tour 1

Historical tour on the Telegrafenberg in Potsdam - science since the 19th century

Venue: German Research Centre for Geosciences (GFZ), Potsdam

09:00 Get on the bus at the Umweltform
10:00 Welcome at GFZ, Säulenforum
11:00 Visit LRI Satellite Laser Station
12:00 Guided tour I: Süringhaus, measurement site, Paleomagnetic Laboratory, the Great Refractor
13:00 Lunch in the cantine (free)
14:00 Guided tour II: optical telegraph, Michelsen cellar, Einstein tower, pendulum hall
15:00 Get on the bus back to Berlin
16:00 Arrival at Umweltforum

Tour 2

Water and carbon dynamics in erosion-affected soil landscapes of hummocky ground moraines

Venue: Leibniz Centre for Agricultural Landscape Research (ZALF), research station Dedelow

09:00 Get on the bus at the Umweltform
11:00 Visit SoilCan lysimeters
12:00 Packed Lunch (free)
13:00 Visit Carbo-ZALF test sites
15:00 Get on the bus back to Berlin
17:00 Arrival at Umweltforum
The Complete Platform for Science - Organizations around the world in the public, private, and nonprofit sectors are using geographic information systems (GIS) as a complete platform for accelerating scientific data exploration and interpretation. Interoperable and open, Esri's ArcGIS platform gives you the power to collect, manage, model, and share geospatial data.

Esri improves decision-making with software and services by combining information from many independent sources such as enterprise data warehouses, Global Earth Observation System of Systems (GEOSS), and Esri’s authoritative Living Atlas of the World. Reveal deeper insights from your GIS data, remotely sensed earth observation data, big data, real-time data streams, spreadsheets, and more.

Esri Deutschland GmbH, Tel. +49 89 207 005 1200, esri.de, education@esri.de

New Precision Trace Gas Analyzers

LI-COR’s laser-based trace gas analyzers will change the way you measure atmospheric gases and ground-level emissions. Multiple patented technologies contribute to the PreciseTech™ Design, providing exceptional performance for atmospheric monitoring or soil gas flux measurements. But don’t take our word for it. The data speak for themselves.

Get the Data Report
www.licor.com/trace-data
Getting there

From Berlin Hauptbahnhof (Central Station) take tram M5 (direction "Hohenschönhausen") or tram M8 (direction "Ahrensfelde") and stop at "Platz der Vereinten Nationen" or stop at "Klinikum im Friedrichshain" and take a 5 minutes walk.

From airport Berlin-Schönefeld take the S-Bahn S9 (direction "Pankow") and stop at "Landsberger Allee", change to tram M6 (direction "Hackescher Markt") and stop at "Klinikum im Friedrichshain", then take a 5 minutes walk.

From airport Berlin-Tegel take the shuttle bus "TXL" to stop "Alexanderplatz", change to tram M5 (direction Zingster Straße) and stop at "Klinikum im Friedrichshain" or "Platz der Vereinten Nationen", then take a 5 minutes walk.
remote sensing

an Open Access Journal by MDPI

Editor-in-Chief
Dr. Prasad S. Thenkabail
Research Geographer-USGS, USGS Western Geographic Science Center (WGSC), 2255, N. Gemini Dr., Flagstaff, AZ 86001, USA

Aims and Scope
An international and cross-disciplinary scientific journal of remote sensing. It publishes research papers, technical notes, short communications and review papers. There is no restriction on the length of the papers.

Author Benefits

Open Access Unlimited and free access for readers
The highest ranking Open Access journal in the remote sensing category
High Visibility So far in 2018, Remote Sensing papers have received 3,930,199 full-text views and 3,727,015 abstract views
Rapid Publication A first decision provided to authors within 19 days
Discounts on Article Processing Charges (APC) Authors from Helmholtz institutes receive 15% discount on APC and some Helmholtz institutes pay APC for authors, see http://www.mdpi.com/about/ioap

Measure your ecosystem ...

Measure the full range

Full Range Tensiometer (FRT)

Real and direct measurement with the Fullrange tensiometer to the wilting point

Do not calculate your model parameters. Measure it!

... It’s not magic: just physics!

Umwelt-Geräte-Technik GmbH  Eberswalder Str. 58  15374 Müncheberg  Telefon: +49 (0) 33 43 2 - 89 575  E-Mail: info@ugt-online.de
Niederlassung Süd Weihenstephanean Berg 4  85354 Freising-Weihenstephan  Telefon: +49 (0) 8 161 - 23 46 441  E-Mail: info-sued@ugt-online.de
METER CREATES THE FUTURE.
SAY HELLO TO HIGH-END SCIENCE.
International Conference
October 8-12, 2018

BESONDERE ORTE
Umweltforum,
Neue Mälzerei
Pufendorfstr. 11
10249 Berlin