

International Autumn School of the DBG Working Group “Soil Gases” “From on-site greenhouse gas flux measurements to budget estimation”

October 11 – October 15, 2021 in Freising

Focus:

To mitigate climate change, demanding greenhouse gas emission (GHG) reduction targets are being negotiated. Meeting these targets requires measurements of GHG exchange between soils, plants and the atmosphere in process-oriented and field studies or on the landscape level. This Autumn School covers challenges of on-site greenhouse gas flux measurements with respect to data quality, analysis and up-scaling.

Combining lectures, hands-on exercises, discussions and a field day, this Autumn School will provide training on the following topics:

- GHG measurement techniques in the field
- GHG flux rate calculation and error estimation
- Gap filling based on empirical modelling
- Spatial and temporal statistics for GHG flux data

Lectures:

- Prof. Dr. Matthias Drösler, Dr. Tim Eickenscheidt (HSWT Weihenstephan-Triesdorf)
- Prof. Dr. Lars Kutzbach, Dr. Christian Knoblauch (Universität Hamburg)
- Dr. Caroline Buchen-Tschiskale, Dr. Roland Fuß (Thünen-Institut)
- Dr. Ralf Kiese (KIT IMK-IFU Garmisch-Partenkirchen)
- Dr. Arne Poyda (CAU Kiel)
- Dr. Gerald Jurasinski (Universität Rostock)

Eligibility:

The Autumn School will be open to 20 doctoral students, postdocs and master students with a background in soil science, agriculture, biogeochemistry or other environmental sciences, with experience in field GHG measurements as well as fundamental skills in statistics and R programming. Students should bring their own laptops.

Application:

Applicants must submit the registration form (<https://www.dbges.de/de/arbeitsgruppen/bodengase/aktuelles>), a motivation letter, and a letter of recommendation from their advisor or other academic familiar with their work to Tim Eickenscheidt (tim.eickenscheidt@hswt.de). **Application deadline is 30 June 2021.** The course fee of 350 € includes course materials, transportation during the course, lunch and social dinner in Freising. Travel and accommodation costs must be paid by the participants themselves. For the Autumn School, 2 ECTS are awarded.

Organizing Committee:

- Prof. Dr. Lars Kutzbach (lars.kutzbach@uni-hamburg.de)
- Dr. Tim Eickenscheidt (tim.eickenscheidt@hswt.de)
- Dr. Caroline Buchen-Tschiskale (caroline.buchen@thuenen.de)

Program:

Start	End	Monday 11.10.2021	Tuesday 12.10.2021	Wednesday 13.10.2021	Thursday 14.10.2021	Friday 15.10.2021
08:30	09:00	Introduction, Overview & Course objectives (Matthias Drösler/Tim Eickenscheidt)	Lecture: Need for standardizing CO ₂ , CH ₄ and N ₂ O gas flux measurements (Gerald Jurasinski)	Lecture: NEE, R _{ECCO} Flux rate calculation; Introduction and methodology (Gerald Jurasinski)	Lecture: CH ₄ , N ₂ O Flux rate calculation; Introduction and methodology (Roland Fuss)	Lecture: Introduction to spatial and temporal statistics of environmental data (Roland Fuss)
09:00	09:30					
09:30	10:00	Introduction of participants	Coffee Break			Lecture: From t-test to GAMM's: Models and statistical inference (Roland Fuss)
10:00	10:30	Coffee Break	Excursion & Exercise: Study Site Freisinger Moos - Autochamber, manual chamber based measurement of NEE, Reco, N ₂ O & CH ₄ ; Ultra-Portable Greenhouse Gas Analyzer (Picarro, Gasmeter, Los Gatos Research, LI-COR Biosciences, GASERA) (Tim Eickenscheidt, Lars Kutzbach, Caroline Buchen-Tschiskale)	Coffee Break	Coffee Break	Coffee Break
10:30	11:00	Lecture: Processes and control of CO ₂ fluxes (Arne Poyda)				
11:00	11:30			Excercise: Hands-on NEE & R _{ECCO} flux rate calculation (Gerald Jurasinski)	Excercise: Hands-on CH ₄ , N ₂ O flux rate calculation (Roland Fuss, Caoline Buchen-Tschiskale)	Continuation: From t-test to GAMM's: Models and statistical inference (Roland Fuss)
11:30	12:00	Lecture: Processes and control of CH ₄ fluxes (Christian Knoblauch)				
12:00	12:30		Lunch box			Wrap-up session
12:30	13:00	Lunch		Lunch	Lunch	Lunch
13:00	13:30	Lunch	Excursion & Exercise: Study Site Freisinger Moos - Autochamber, manual chamber based measurement of NEE, Reco, N ₂ O & CH ₄ ; Ultra-Portable Greenhouse Gas Analyzer (Picarro, Gasmeter, Los Gatos Research, LI-COR Biosciences, GASERA) (Tim Eickenscheidt, Lars Kutzbach, Caroline Buchen-Tschiskale)	Lunch	Lunch	Lunch
13:30	14:00	Lecture: Processes and control of N ₂ O fluxes (Ralf Kiese)				
14:00	14:30			Lecture: Methods for data-gap filling (CO ₂) (Lars Kutzbach/Tim Eickenscheidt)	Lecture: Methods for data-gap filling (CH ₄ & N ₂ O) (Ralf Kiese)	
14:30	15:00	Lecture: Introduction into methods for quantification of land-atmosphere GHG fluxes (Lars Kutzbach)				
15:00	15:30			Coffee Break	Coffee Break	
15:30	16:00	Coffee Break	Coffee Break			
16:00	16:30	Continuation: Introduction into methods for quantification of land-atmosphere GHG fluxes (Lars Kutzbach)	Lecture: Required ancillary data, data handling & preparation (Gerald Jurasinski)	Excercise: Hands-on gap filling (CO ₂) (Lars Kutzbach, Tim Eickenscheidt, Gerald Jurasinski)	Excercise: Hands-on gap filling (CH ₄ & N ₂ O) (Ralf Kiese, Roland Fuss, Caroline Buchen-Tschiskale)	
16:30	17:00					
17:00	17:30	Poster, drinks & fingerfood	Excercise: Introduction into R and data preparation (Gerald Jurasinski)			
17:30	18:00					
18:00				Joint dinner	

Further information: The program and further information are available at (<https://dbges.de/de/arbeitsgruppen/bodengase/aktuelles>)