

5th UFZ Research Green Roof Newsletter

UFZ – Research Green Roof



Photo: The UFZ Research Green Roof in January 2021 (author: Jan Knappe, UFZ)

More information on UFZ Research Green Roof: <http://www.ufz.de/forschungsgruendach>

Questions to UFZ Research Green Roof: forschungsgruendach@ufz.de



Research green roof

at the Helmholtz Centre for Environmental Research – UFZ



Europäische Union

Europa fördert Sachsen.



Europäischer Fonds für regionale Entwicklung



This construction measure is co-financed by tax funds on the basis of the budget passed by the members of the Saxon state parliament.

Research partners:



Bundesamt für Naturschutz



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Research on the UFZ Research Green Roof

Working group "Biodiversity and Plant Growth Modeling"

In the group "Biodiversity and Plant Growth Modeling" the Department of Ecological Modelling (UFZ) and the Department of Conservation Biology (UFZ), as well as the University of Leipzig are represented. Professional advice is provided by the Department of Community Ecology (UFZ) as well as by the companies engineering office Blumberg and ZinCo.

The biological **research objectives** are integrated into the overall climatic and hydrological context of the joint project. The focus of the activities is directed towards the identification of comparatively stable and species-rich plant communities that correspond very well to the technical conditions of roof types, fulfill important ecosystem functions and meet nature conservation concerns.

The research includes:

- Determination and evaluation of growth performance, reproduction and dispersal ability of cultivated plants
- Recording and monitoring of vegetation development, partly with tolerance of spontaneously occurring species
- Comparative studies on the influence of care measures on vegetation
- Modeling of plant growth with succession forecasts
- Studies of the arthropod fauna (especially insects) by evaluating traps



Figure: Square separation in species mapping
(Author: Peter Otto, Uni Leipzig)

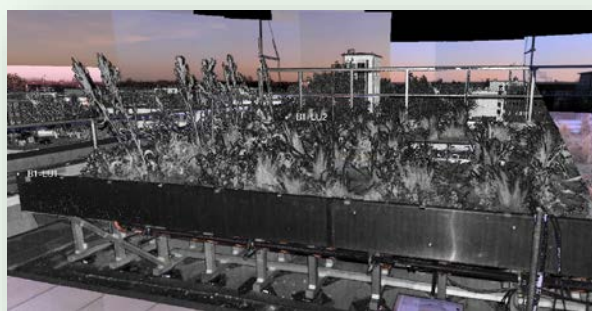


Figure: sample scan of the Trimble SX10 total station from the wetland roof
(Author: Hans Dieter Kasperidus, UFZ)

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Working group "Process-related indicators of different green roof variants"

With the current icy temperatures and periodic snowfall here in Leipzig, our research green roof looks more like a white roof covered in a thick, beautiful blanket of snow if the conditions allow. Despite the winter operation, i.e. all water pipes have been drained and disconnected, we still continue with other routine measurement on the roof. One of them being the regular drone flights to monitor both the long-term development of the vegetation as well as temperature distributions on the green roof types. The latter is done by sensing the surface temperature by means of an infrared camera that is attached to the drone. This will help to identify seasonal patterns of the expected cooling effect the respective green roof types will have in comparison to each other but also in comparison to other, conventional roofs types as well as natural surfaces such as lawns and small water bodies.



Figure: Research green roof under a snow blanket on January 18, 2021
Author: Jan Knappe



Figure: Determining surface temperature via IR camera on January 18, 2021
Author: Jan Knappe

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Working group "Green Roofs as a Pollutant Sink"

The now consolidated "Pollution Sink" working group (UFZ Departments ISOBIO, TUCHEM und UMB) aims to investigate uptake, transport, and transformation/degradation processes of air- and waterborne environmental pollutants; in order to evaluate green roofs' potentials for pollutant removal. In collaboration with the Otto von Guericke University Magdeburg four topics for master theses are currently being offered, which will address the efficiency of biological degradation processes and tailor-made adsorber materials for pollutant elimination and retention, respectively. Furthermore, the planned research activities of the Department ISOBIO will be supported by a guest scientist from China for one year.

Working group "Climate study and climate modeling of the impact of green roofs on buildings and cities."

The working group "Climate Modeling" (UFZ-Department of Urban and Environmental Sociology) combines experimental studies on the surface energy balance of green roofs with microclimatic modeling. The objective is to assess the climate impact of different green roof concepts on the urban climate.

Since May 2020, a dissertation by M.Sc. Niels Wollschläger on the topic of "Urban resilience through urban green" has been running as part of the BMBF-funded project "KlimaKonform". For the period March to September 2021, the working group will be reinforced by meteorology student Willy Stöckel (University of Leipzig), who will write his bachelor thesis on the topic "Determination of the soil heat flux of green roofs".

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Students and young scientists conduct research on the research green roof

The following qualification work and internships are currently being carried out on the research green roof:

WG Climate modeling:

- **M. Sc. Niels Wollschläger: Urban resilience through urban green** (dissertation at the UFZ-Department of Urban and Environmental Sociology within the BMBF-funded project KlimaKonform (FKZ: 539 01LR2005D), UFZ supervisor: Prof. Uwe Schlink, duration: 05/2020-05/2023)

WG Biodiversity and plant growth modeling:

- **Merle Pfaffelmoser: Comparative studies of the functional characteristics of wetland plants on the UFZ Research Green Roof (Leipzig) and in nature-based vegetation as well as an inventory of the arthropods on the green roof with evaluation of their relevance for the plants located there** (master thesis at the MLU - University of Halle in cooperation with the University of Leipzig, Co-supervisor (Uni Leipzig): Dr. Peter Otto)
- **Stephanie Arnold: Potentials and limits of plant and vegetation structure determination at different scan and image resolutions** (project work at TU Dresden, UFZ supervisor: Hans Dieter Kasperidus, duration: 12/2020-05/2021)

UFZ Research Green Roof Meetings

The dates for the next UFZ Research Green Roof meetings are:

- on February 11, 2021 at 10.00 a.m. online in form of a video conference
- on March 11, 2021 at 10:00 a.m. building 4.0, room 101 or virtual
- on April 15, 2021 at 10:00 a.m. in KUBUS/hall 2 or virtual



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