

12th Newsletter of the UFZ Green Roof Research



November 04, 2022



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:



UNIVERSITÄT
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Practice partners:



Stadt Leipzig
Amt für Umweltschutz

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UFZ Green Roof Research

Working group „Climate study and climate modelling of the impact of green roofs on buildings and cities“

To evaluate the potential of different green roof systems for climate adaptation in urban areas, differences in energy fluxes are investigated. **Ultrasonic measurements** are used to determine the convection (sensible heat flux, which is responsible for heating of the near-ground atmosphere) of the roofs from the high-frequency fluctuations in wind speed and temperature and allows an assessment of the thermal performance of the different roof systems. Figure 1 shows the differences in convection between the gravel roof and the extensive green roof as a function of soil moisture. If this difference is greater (smaller) than 0, the extensive green roof warms (cools) the environment compared to the gravel roof. In the summer of 2022, the extensive green roof tended to have a warming effect on the surroundings, as evaporation rates were relatively low due to the lack of precipitation. Thus, much incoming energy was converted into heat. Significant cooling effects can only be observed in phases with sufficiently high soil moisture values of the extensive green roof (> 8%). The dependency on soil moisture content shows that additional irrigation is necessary during dry periods to maintain the cooling potential.

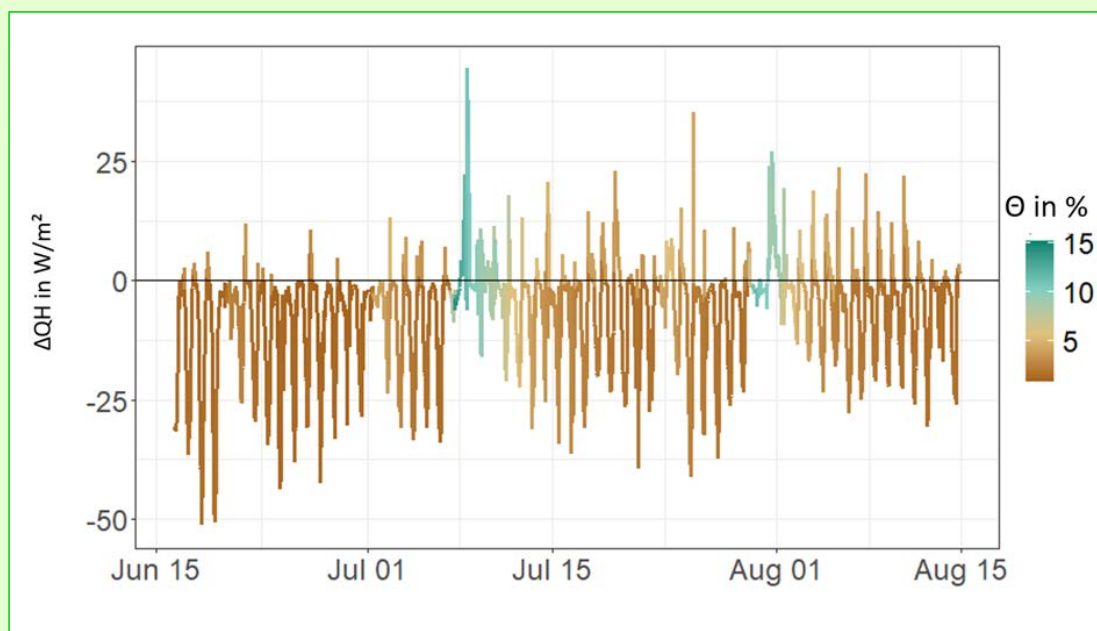


Figure 1 - Time series of the difference of the sensible heat flux over the gravel roof and the extensive green roof (ΔQH) for summer 2022.

With negative values, the extensive green roof leads to stronger heating of the surroundings than the gravel roof, while with positive values the surroundings are relatively cooled. The color scale corresponds to the soil moisture values of the extensive green roof (Θ) measured with SMT 100 sensors.

Author: Niels Wollschläger (SUSOZ, UFZ)

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Working Group „Process-related indicators of different green roof variants“

Dominique Hofmann, a student at the TU Berlin, has been studying the rainwater retention capacities of different green roof variants and their microclimatic effects at neighbourhood level since September. Dominique is carrying out water balances for all four roof segments of the research green roof for the year 2022 and evaluating the surface temperatures of the respective roofs measured by thermal drone at different air temperatures.



Photos: Lucie Moeller, UFZ

Working Group „Green Roofs as a Pollutant Sink“

On 12-13 October 2022, the **1st Science Days** took place at the UFZ. Dr Steffen Kümmel from the was significantly involved in the "UFZ-Green Roof Research" exhibition. Various green roof variants were presented on a table in the "Science Marketplace", as well as the approaches of the "Green Roofs as Pollutant Sinks" working group. During a guided tour, the participants then had the opportunity to look at the research green roof and the isotope laboratory and ask questions about green roof research at the UFZ.



Photos: Lucie Moeller, UFZ

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Working group „Biodiversity“

Anastasia Härtel's bachelor's thesis was submitted on time in September and was evaluated very positively by the reviewers. Key results of the thesis will soon be presented at a green roof research meeting.

Following the methodology of **Merle Pfaffmoser's** activities in 2020, arthropods were again captured in August and September 2022. This was done using window traps (for all flying arthropods, Fig. 2A), yellow traps (especially for hymenopterans, Fig. 2B) as well as ground traps (especially for ground-bound arthropods, also from the group of nuisance species). The next step will be to pre-sort the catches primarily by insect order before specialists determine genera and species.



A



B



C

Figure 2: Insect traps on the research green roof.

A: Window trap on the marsh plant roof, B: a yellow tray on the extensive roof, C: a ground trap on the extensive roof.

Photos: Lucie Moeller, UFZ

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Information seminar "Green roofs as a building block for strengthening climate resilience in municipalities"

On 29 September 2022, an information seminar for municipal stakeholders entitled "Green Roofs as a Building Block for Strengthening Climate Resilience in Municipalities" was held at the UFZ in cooperation with the Geopark Porphyryland Steinreich in Sachsen e.V., in which our UFZ green roof researchers played a key role. In this info seminar, both the positive effects of green roofs and the associated challenges in the planning, construction and maintenance of green roofs were highlighted and discussed. Part of the info seminar was a tour of the municipal green roof on the old main post office, where many different green roof structures were presented. We would like to thank the presenters for their participation and the UFZ for the financial support from the Knowledge Transfer Fund.



Photos: Lucie Moeller, UFZ

Excursion to Gondwanaland

On 8 September, the UFZ green roof researchers visited Gondwanaland under the guidance of Mr. Krahnstöver from Krahnstöver & Wolf GmbH. The main interest was in the technical and botanical aspects of Gondwanaland - a large green roof construction.



Photo: Lucie Moeller, UFZ

More information on the UFZ Green Roof Research:

<https://www.ufz.de/forschungsgruendach>

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