

Germany – UFZ – Research green roof platform



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DESCRIPTION

The UFZ Research Green Roof platform is tackling key urban challenges related to climate adaptation, exploring the **potential of multifunctional blue–green infrastructures**. The platform encompasses different blue–green infrastructures located at the UFZ campus Leipzig and in the city of Leipzig. The infrastructure platform includes different green roofs as well as tree swales. These systems contribute to **stormwater management**, mitigate urban heat through evapotranspiration, serve as sinks for CO₂ and airborne pollutants, and enhance **urban biodiversity** by providing habitats for plants and animals. Research at the UFZ focuses on optimizing blue–green infrastructures for a range of environmental and urban needs. This includes investigating their effectiveness in stormwater retention, temperature regulation, and improving urban microclimates. Researchers are also examining the most resilient plant species for green roofs, their role in supporting biodiversity, and their potential as decentralized treatment systems for low-polluted wastewater, such as greywater. In addition, studies are evaluating how different green roof types can act as pollution sinks, absorbing airborne contaminants, while reducing pressure on urban drainage systems. The UFZ Research Green Roof platform aims at providing long-term monitoring and performance metrics for blue–green infrastructure modeling & planning. As part of the performance metrics novel monitoring and modeling approaches are developed. Further the platform allows to operate the infrastructure under different functionalities and to investigate multifunctionality. In the framework of MULTISOURCE rainwater and overflow samples were collected from the green roofs and vegetation data were monitored for tree swales and urban trees.



DESIGN AND TECHNICAL DETAILS

Type of influent

- Rainfall

Design criteria

- Stormwater retention | biodiversity.
- Different vegetation mixes and soil depths.
- Different retention layer depths.
- Different management strategies (stormwater/ drought | irrigation | biodiversity).

Climatic conditions

Temperate climate with seasonal variations in rainfall.

Operational constraints



Manpower



Skills



Working in heights & potential constraints due to roof load

CO-BENEFITS



The UFZ blue-green infrastructure is open to researchers and practitioners as a research facility as well as a demonstration platform. Originally designed and operated towards biodiversity and stormwater, several studies across various disciplines have looked into multifunctionality and co-benefits. Co-benefits were extracted from the studies and systematically reviewing the key findings and the mentioned co-benefits. The **main themes – ecosystem services, climate adaptation, water resource management, air quality improvement, and building protection** – were identified across the studies. Key facts and outcomes of each study were highlighted, and the co-benefits were categorized into subcategories and overarching categories. Next to the co-benefit overview, the interlinkage with main functionalities – both in terms of **infrastructure design** as well in terms of **infrastructure operation** is essential. As an example, different irrigation schemes target different functionalities, i.e. biodiversity or cooling and affect stormwater functionality.

TAKE-HOME MESSAGES

- **Main functionalities** focus on stormwater mitigation & enhanced biodiversity
- **Multiple co-benefits** regarding ecosystem services, building management & maintenance, water resources management, climate adaption & mitigation, air quality & pollutant reduction, as well as health & social impacts were specifically addressed in over 15 studies at the UFZ platform.
- **Development of novel modeling and monitoring** approaches for blue-green infrastructures

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