UFZ Planetary solutions
KNOWLEDGE THAT DELIVERS.

Profile

Climate-Resilient Cities



The challenge

Whether heavy rain, heat, or drought, towns and cities must prepare for extreme weather events. This complex task involves not only urban and green space planning, water supply, housing and road construction, architecture, and legal issues but above all the people who live and work in cities and want to feel at home there.

We bring together water, green spaces, and renewable energy to create neighbourhoods that are more resilient to extreme weather and that people enjoy living in.

Our planetary solution

Our 'blue-green-red' approach combines water (blue), plants and green spaces (green), and architecture and energy (red) to achieve sustainable urban planning. According to the 'sponge city' principle, rainwater is retained in green spaces, around trees, on green roofs, or in infiltration areas, where it can infiltrate or evaporate instead of flowing directly into the sewer system. At suitable sites, rainwater that seeps into the ground can also contribute to groundwater recharge and thus help secure the drinking water supply in the long term. This reduces pressure on drainage systems during heavy rainfall, reduces flooding, and helps mitigate heat and drought. Local authorities can thus save costs because less rainwater enters the sewerage system and investment in additional capacity can be avoided. Housing associations and commercial enterprises can design their premises in a climate- and energy-efficient manner and thus reduce their operating costs. Using 'functional digital twins' (i.e. computer models of individual neighbourhoods or entire cities), it is possible to compare different measures, select the best ones, and accelerate implementation. This ultimately benefits everyone who lives in the city.

Our partners

We carry out our research through 'co-design' in collaboration with stakeholders such as local authorities, housing associations, and water and municipal utility companies. Our model cities are Leipzig and Halle. Through the 'Blue-Green City Coaching' programme and in partnership with organisations such as the Deutscher Städtetag (Association of German Cities), the Federal Environment Agency, and local and specialist networks, we share our knowledge with other cities.

Relevant knowledge and technologies

Model-based scenarios and functional digital twins: Planning tools show how much water is available in a neighbourhood, how much can be stored around trees or on green roofs, and how different measures affect local temperatures.

Scalable concepts and steering networks: We bring together the various municipal departments and establish firm structures for joint planning. With 'Blue-Green City Coaching', we are extending the concept to other medium-sized German towns. Our research is one of the 20 missions in the Action Plan on Sustainability for a Modern and Future-Proof Germany.

UFZ HELMHOLTZ Centre for Environmental Research

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Additional links:
Website: Systemic solutions for liveable and climate-resilient cities
Website: Leipzig BlauGrün project
Media Coverage: Leipziger BlauGrün online media response