

# Can Berlin transform itself into a sponge city?

*Car traffic roars along the eight lanes of Bismarckstrasse in Berlin's Charlottenburg district. Standing next to this strip of asphalt, nearly 40 meters wide, there is nothing that invites a passerby to linger. But just a few steps away, around the corner on Fritschestraße, a green oasis awaits.*

*Author: Christian Schwägerl, editing: Katharina Jakob, translation: Gretchen Vogel*



*Jörg Winners watering plants.*

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There, trees are surrounded by large beds filled with ferns, periwinkle and pansies. A blackbird turns over leaves in search of worms. Natural stones are layered along the edge of the sidewalk almost as if they were in a stream bed. Next to one of the city's

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historic dark green water pumps—maintained by the city since the 19th century to secure water supplies in case of a crisis—there is a bathtub filled to the brim. The water reflects the ornate, Wilhelminian-style apartment houses that line the street. In a garden plot, converted from a parking space, residents grow vegetables.

"Just a few years ago it was a street like any other," says Jörg Winners, one of the residents who helped transform Fritschestraße. A film producer by profession, he has found a new passion: He teamed up with neighbors and like-minded people from other parts of the city to try to help make Berlin more resilient.

## **"We realized we needed rain barrels"**

The changes on Fritschestraße are designed to help answer crucial questions that every city in the world is facing: What will

happen to its residents as a result of global warming? And how can everyday urban life, and its infrastructure, be redesigned so that the urban climate remains bearable and nature remains alive in the city? As one part of the answer, a growing number of metropolitan regions are taking steps toward becoming "sponge cities" —including Berlin.



*Trees line Berlin's Fritschestraße.*

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When Winners started, the term was still foreign to him. But after several extremely hot and dry summers, punctuated by floods after heavy rains, that changed. Adding more green to the streetscape could only be the first step, he and his neighbors decided. "We realized we needed rain barrels," Winners says—a way to intercept the water from heavy rain before it flows into the sewer system and causes it to overflow. Then, when it's hot and dry again, trees and gardens can be watered and playing children can cool down. The rainwater ultimately flows into the ground, not into pipes.

## Heatwaves and heavy rainfall on the rise

Water storage is the key to Fritschestraße's transformation into a green oasis. Four large gray barrels with a total capacity of 3,000 liters collect what would otherwise pour into the sewage system from gutters and downspouts. A public-private initiative called Wassertanke (water tanks) has the goal of installing such barrels every 150 meters throughout Berlin.



*Berlin's first sidewalk rain barrel.*  
© Christian Schwägerl



*Jörg Winners (right) and his fellow neighborhood activists Katrin Wittig and Hans Jürgen Zschäbitz in front of one of the Fritschestraße rain barrels.*  
© Christian Schwägerl



Across the city, people are pitching in to help adapt their living space to climate change—in part because the threats are becoming ever more apparent. In recent years, according to the Komptenzzentrum Wasser Berlin (KWB) research institute, Berlin has had some of the lowest amounts of precipitation in the country. Frequent heat waves of more than 38 degrees Celsius in the city center have made summers less and less bearable, especially for older residents. Long periods of drought have caused Berlin's rivers, ponds and moors to dry out—impacting the amphibians, dragonflies and bird species that depend on wetlands. Groundwater levels are falling to dangerously low levels in the regions from which the city draws its drinking water.

The heavy rainfall of the past few months will provide only temporary relief. In addition to climate change, Berlin is facing another challenge. Paradoxically, it stems from a major element of Germany's decarbonization efforts, the phase-out of coal-fired power plants by 2038. Currently, a significant part of Berlin's drinking water reaches the city from the southeast via the river Spree, which flows into to the Müggelsee, the city's largest lake. From there it seeps into the subsoil and is naturally filtered as it flows underground, before it is pumped to the surface again. However, the water levels in the Spree have been artificially high for decades, thanks to coal mines located upstream of Berlin in Lusatia. There, huge amounts of groundwater have been pumped into the river to keep the mines dry.



*Protest against the Tesla car-making plant in Grünheide near Berlin on May 10, 2024.  
© picture alliance/dpa*



*In Germany, all coal mining will end by 2038.*

*© Christian Schwägerl.*

## Berlin was built in a swamp - and is now at risk of drying up

This will end as coal mining is phased out over the next decade. The mine pits will be allowed to fill up and become lakes, so the pumping will stop and significantly less water will flow toward Berlin. Experts predict that the city will receive at least 10% less water compared to the long-term average—and around 20% less when compared to the low water levels of recent years. There are concerns that Berlin, a metropolis that over centuries was built in the middle of a vast swamp, could soon find itself left high and dry. "In the past, people were proud when every drop of rain was redirected to flow into the drains," says Stephan Natz from the Berliner Wasserbetriebe, the city-owned water authority. It is now clear that this long-standing approach has no future. "Berlin needs that water," he says.

Berlin's leaders have long known that a fundamental change is needed. In 2018, the city government, then led by a coalition of Social Democrats, Greens and the Left party, founded the Berliner Regenwasseragentur (Berlin rainwater agency) as part the Berliner Wasserbetriebe. Today they might call it the "Sponge City Agency" instead. The city as a sponge that absorbs water in wet times and stores it for dry times—the strategy is now recognized worldwide as a way to combat the climate crisis. Copenhagen and Rotterdam are two of the pioneers. The Chinese government is now ordering its cities to rapidly convert into sponge cities. Several cities in the U.S., including Los Angeles, are also taking similar steps. And Berlin?

"In the future, most of the rainwater that falls on the city will no longer flow into the sewer system, but into the ground—and from there will evaporate through the vegetation or become new groundwater," says Darla Nickel, head of the rainwater agency. It's a mammoth task, especially in a city whose population, contrary to previous forecasts, will soon rise to four million people.



*During heavy rainfalls - as here in Tiergarten in 2019 - Berlin's sewer system is quickly overwhelmed. © picture alliance/dpa*



Berlin doesn't have anything to be ashamed of in comparison to other cities, Nickel says. On the contrary, six years ago the city already enacted a law requiring new buildings and larger urban development projects to utilize rain water on their own premises. That can mean allowing rainwater to seep directly into the ground, using it for small ponds or making it available for watering plants. One example is the "Buckower Felder," a new development in southern Berlin that is a showcase for how the sponge city concept can work. It will include 900 apartments for 2,500 people, a daycare center, a youth facility and commercial space. Long before construction of any buildings began, water experts worked to build the sponge infrastructure—constructed mainly out of concrete containers buried underneath the development. During heavy rains, they can collect large amounts of building runoff and then allow the water to gradually seep into the ground. Rainwater is also directed toward trees, stored in shallow depressions included in the landscaping and, if needed, directed into a small natural flood area. The development is designed to imitate the natural water cycle.

Another showcase project is located in the city center. The historic Gendarmenmarkt is currently being rebuilt so that its rainwater runoff is collected in underground containers and then gradually drains into the ground.



*Walter-Benjamin-Platz in Charlottenburg was built according to plans by the architect Hans Kollhoff. A counter-proposal by Hinrich Baller included several small bodies of water and plenty of trees, but it was rejected by Hans Stimmann, director of city planning at the time, who said he was a fan of "a Berlin made of stone."*  
© Christian Schwägerl



*In 2023 the Panke, a tributary of the Spree from the north, fell completely dry for several weeks.* © pa/ ZB/ Sascha Steinach

New office buildings in Berlin have to comply with the “sponge city” requirements as well. From the outside, nothing unusual is visible at first glance. But the roofs include extensive systems for collecting rainwater, and the inner courtyards contain trees and plantings — all designed to avoid flushing rainwater into the sewage system.

## **Mammoth task with a growing population**

The sponge city is also being constructed on the city's higher elevations. Green roofs are an excellent way to absorb and store rain before later allowing it to evaporate, another way to lessen the burden on the sewage system. They also create new habitats for insects and birds. With a funding program called GründachPlus (green roof plus), Berlin's Department for the Environment supports projects that benefit both nature and climate adaptation. The project has already funded the greening of one hectare of roof area, and 16 more hectares are in preparation. There are now around 600 hectares of green roofs in Berlin—a total area of 2.5 by 2.5 kilometers.

While some progress is visible, the numbers also make it clear that the transformation into a sponge city is progressing far too slowly. In Berlin, there are 10,000 hectares of roof space. At the current rate, it would take centuries for all of it to be greened. No city government has yet been able to agree on new requirements for the owners of existing buildings. The politicians are afraid of incurring the wrath of voters by requiring too many costly renovations.

There is already massive resistance to other urgently needed measures, for example converting parking spaces into patches of water-absorbing green. “You need space to be able to reduce the amount of asphalt and concrete,” Nickel says. In order to drain the water from 100 square meters, one needs an average of 20 square meters of open ground. “And that is often difficult when there is already fierce competition for every square meter, whether for accommodation, parking spaces, bike paths, trees, emergency routes or public transport.”

The renovation rate for streets and properties in Berlin is “definitely less than one percent per year,” says Nickel. “You can see the speed at which we are traveling.” The transformation of Berlin into a sponge city is progressing only in small steps, while the water crisis is gaining dangerous momentum.

## **Artificial “mini-moors” in the city center**

A look into a backyard in the city center shows how much further along Berlin could be—if more decisive action had been taken. From Potsdamer Platz it is only a few steps to Bernburger Straße, where a visitor finds an unusual “garden.” Inside a large fenced area, moss and reeds grow on square areas bordered with concrete. “I call them our mini-moors,” says Anja Steglich, landscape architect and project manager at StadtManufaktur, an urban development think tank supported by the Technische Universität Berlin (TU Berlin).



"The rainwater from the neighboring residential buildings ends up on our property, where it slowly evaporates and cools the surrounding area," Steglich explains. "You notice it when you stand here in the summer. We enjoy a much lower temperature than the surrounding neighborhood." The project dates back to 1987, when Berlin hosted the International Building Exhibition. One of the goals was to show how "social-ecological urban renewal" could be successful. "Berlin was at the forefront very early on, with lots of attention and support," says Steglich. "But actually implementing such groundbreaking concepts on a large scale is something the city was, and is, not good at."



*Rainwater can be collected with a layer of gravel and soil.* © IBeB



*The green roof is also meant to support birds and insects.* © IBeB

Berlin's overall approach to urban nature is similarly mixed. City experts praise the natural water cycle as a role model and praise the role of city trees and small bodies of water for their role in the sponge city. At the same time, there are increasing signs that the current government, a coalition between the Christian Democrats and Social Democrats, is going backwards when it comes to nature conservation. The senator responsible for urban development and construction, Christian Gäbler, has proposed a new "faster building law" that is intended to pave the way for all kinds of construction projects. Instead of the sponge city, his priority is a flood of quickly-erected buildings.



This spring the city cut down trees on a massive scale, which citizens tried in vain to stop. In one case, 63 trees lining a major boulevard fell victim to chainsaws only to prevent a construction project from temporarily blocking a car lane. Instead of increasing, the number of trees lining Berlin's streets has recently shrunk. While in Paris, for example, trees are being planted non-stop in order to have enough shade and drainage areas for the future climate, Berlin last year planted 3,026 young trees but cut down 6,715.

Against this background, an initiative started this month to collect signatures for a referendum on the future of the city's green space. The demand of "BaumEntscheid" (tree referendum) is to increase the number of trees lining the city streets to 800,000 by 2025, almost double the current number.

The city's amphibians, which were supposed to be mascots of the sponge movement, are not in good shape either. Most species are endangered. Of the 400 small bodies of water that still exist in the Berlin urban area, "many are in extremely poor condition and require urgent action (...) especially for amphibians," according to Berlin's scientific advisory body on nature conservation. The Berlin city government officially calls these small bodies of water "blue pearls," but does not have solutions for how to protect them on a large scale.



*An artificial "mini-moor" in the middle of Berlin.*

*© Christian Schwägerl*

The KWB points out an additional problem that affects not only amphibians, but also people: When rainwater flows over roofs, facades and streets, it collects a variety of potentially harmful chemicals—pesticides and flame retardants used in roof construction, toxins from tire wear. KWB experts warn that the advantages of the sponge city could be "reduced or even reversed by contaminated rainwater." They recommend the creation of filter systems and regulations that limit the use of dangerous chemicals during construction.



## Will Berlin become a functioning sponge city in time?

Initiatives like those on Fritschestraße, projects like the Buckower Felder and programs like GründachPlus demonstrate that many solutions already exist. At the same time, threats to amphibians and the warnings about dangerous chemicals show that a sponge city is about more than just redirecting the flow of water. The city and district governments claim to be on board, but there is not yet any strategy that will roll out standardized solutions citywide for both old and new buildings and for all asphalt surfaces. Given the climate forecasts, this is risky. In the end, it is not good intentions or empty claims that make a difference in the quality of life in the city, but rather the real-life water cycle.

Steglich warns that Berlin needs to significantly pick up the pace. "Otherwise, water shortages threaten to massively restrict life in the city."

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