# 16. Of contingent waters and fragile futures

## Thinking Berlin's looming water crisis through the temporalities of the hinterland

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### Introduction

> Those Brandenburgers, they are so convinced about their lakes in Lusatia. I mean, I have no idea why they are holding onto these plans, but creating an entire lake district with all this surface for water to evaporate is so outdated.

So laments a senior civil servant in charge of Berlin's water management, frowning at us.[1] It is a hot day in June 2025. We meet in her office at Berlin's Department for Urban Mobility, Transport, Climate Action and Environment on a field trip with urban planning students to study the city's strategies to tackle water scarcity. Perplexingly, though, while my students entered the meeting eager to learn about water-sensitive urban design, sponge-city approaches, and planning interventions such as rainwater retention, they were offered a presentation of Berlin's hinterland, Lusatia.

Berlin's future is tarnished by a looming water crisis. As demands for water rise due to the city's population growth, climate-change induced droughts and reduced rainfall have drastically lowered groundwater levels. Another significant yet often overlooked factor contributing to the city's water scarcity is the planned closure of nearby coal mines in the region of Lusatia. A quick

1 Interviews were conducted in German; interviews and non-English quotations have been translated by the author.

1.5-hour train ride east of Berlin, Lusatia has constituted a vital water source for Berlin over the past decades by artificially supplying the river Spree, from which Berlin now extracts most of its drinking water, through discharging groundwater extracted through mining into the river. However, as Germany's coal exit is expecting completion by 2038 at the latest, these artificial inflows are also coming to a halt (Water News Europe, 2025). At the same time, Lusatia is set to become Europe's largest artificial lake district through the engineered flooding of abandoned brownfields – using groundwater and the river Spree. Planned as the Lusatian Lake District (LLD), the region's future of brownfield restoration is imagined as one of lush lakes, where tourism is hoped to fill the economic gap created by the coal exit.

Against this backdrop, the statement by the Berlin civil servant is telling in two regards. On the one hand, it indicates, rather contemptuously, the city's dependence on Brandenburg, the federal state in which Lusatia is partly situated, for water supplies. On the other hand, and more implicitly so, it signals the uncertainty that comes with this dynamic, expressed in a sense of powerlessness against the region's planned vision of the LLD, which, in the Berlin water department manager's mind, will lead to water waste that could otherwise be avoided. Curiously, this uncertainty appears to be rooted in the temporal element of 'outdated' plans, implying that these plans are not 'up-to-date' with contemporary climate change scenarios. Indeed, while plans for the LLD embody the region's hopes for new economic revenues, spatialized through municipal developments of harbour districts and new industries on the lakes, this vision is increasingly made complicated by depleting water availabilities. Lakes are not filling up as quickly as expected. The plans upon which these developments rest date back to the early 2000s. They were based on environmental projections from the late 1990s, which failed to predict the overlapping consequences of mining and climate change–induced water scarcity now characteristic of the region.

Water scarcity is thus introducing a whole enigma of temporal dimensions into the planning of the LLD, not only raising questions about the when and how of this future vision but also precipitating uncertainties and unpredictability about the hydrosocial future of Berlin. While it is increasingly unclear at what speed the lakes will be filled, it is also uncertain when Berlin will run out of water and how quickly measures countering this scenario need to be in place. In this chapter, I want to sit with this enigma, scrutinizing how Berlin's looming water crisis is defined by what I call 'the contingent temporalities of the hinterland', alluding to the specific rhythms of hinterland

shaped by ever-changing, situational, and often uncertain conditions. Specifically, I underscore the plural 'time perceptions' (Hanusch and Meisch, 2022) of this situation, not only tracing how current plans are being complicated by hydrological time but also inquiring into the plural logics of the hinterland's seeming inability to adjust to the rapidly changing context: How do contingent temporalities unfold? What implications do they entail for Berlin's looming water crisis?

To answer these questions, I mobilize debates in urban studies on the contingencies of city-hinterland relations (Brenner and Katsikis, 2020) and bring them into conversation with literatures on hydrological time. Situating my analysis at the junction of these literatures, I attend to two blind spots in discussions on city-hinterland relations. First, as works engaging with city-hinterland relations have offered valuable insights for conceiving of urbanization as a process that is actively supported by non-city spaces and the uncertainties embedded therein, they have paid less attention to its temporal dynamics. Second, while, urban political ecology literature has been of tremendous value for tracing hydrosocial relations and how water scarcity is socially constructed, it has not engaged greatly with water as a temporal factor. Addressing the role of time in the contingent city-hinterland relations between Berlin and Lusatia that are created by water scarcity, I aim to fill this gap. Building on document analysis and interviews with key actors, I argue that these contingent temporalities unfold through three dimensions, namely, diverging visions, delayed predictions, and fragmented responsibilities. Together, they present ambiguous implications for Berlin's future water supply.

The chapter is structured as follows: First, I introduce the conceptual prism through which I examine the contingent temporalities of the hinterland, located at the junction between theories of the hinterland and hydrological time. Subsequently, I present the methodological basis and the context of the case of LLD, before I then spell out my argument about the unfolding contingent temporalities of the hinterland. Finally, I conclude by reflecting upon the fragile city-hinterland futures these contingent temporalities give rise to.

## Tracing the contingent temporalities of the hinterland

In order to trace Berlin's water crisis through the temporalities of its hinterland, and the contingencies rooted therein, I connect two bodies of literature in urban studies that have thus far stayed largely apart: discourse on the contingent nature of the hinterland, and on water as temporal factor.

### The negative potentiality of the hinterland

Hinterlands – those non-urban spaces that actively support urban life – have long been relegated to the margins of urban theory and urban studies but have seen a recent increase in attention. Stemming from Lefebvrian discussions around the need to dissolve a sharp urban-rural dichotomy (Lefebvre, 2003), such perspectives spell out a multi-scale understanding of urbanization (Brenner, 1999; McCann, 2017) that is by now well-rehearsed. Questioning city-centric approaches to urban analysis, this scholarship conceives of cities as encompassing not only metropolitan regions but also the extended landscapes of primary commodity production. Crucially, these scholars argue that urban processes are materialized within city spaces while simultaneously exceeding them, thus holding that 'the urban problematique can only be deciphered adequately through an approach that systematically connects them [the hinterlands], at once in social, political, material, infrastructural and ecological terms' (Brenner and Katsikis, 2020: 25–26).

In this context, the hinterland has emerged as a specific axiom to describe the non-urban. Given its differentiation and variegation, Pushpa Arabindoo highlights how the hinterland is distinct from the peri-urban, which still relies on the urban, and yet it is systematically connected to the urban as a process mediated through institutional, political, social, and environmental factors (2020: 20). As such, the hinterland is organized around a range of spatial scales: 'an assortment of morphological forms and settlement typologies including the urban, the suburban, the peri-urban, the rural, and even the wilderness' (ibid.). These comprise various types of settlements (towns, villages), land-use configurations (industrial, agrarian, extractive, energetic, logistical), and ecologies (terrestrial, oceanic, subterranean, atmospheric), encompassing supply zones, impact zones, sacrifice zones, and logistics corridors (Brenner and Katsikis, 2020).

Under conditions of climate change, scholars have argued that contemporary hinterlands constitute a territorial form of urbanization that can no

longer be described through the idiom of 20th-century agglomeration processes but must be radically reimagined. Neil Brenner and Nikos Katsikis point out that while the material and energetic flows mediating city-hinterland relations have been studied extensively (see e.g. Ranganathan and Balazs, 2015; Bahers et al., 2020; Bartels et al., 2020), the hinterland itself has remained an enigmatic 'black box' (Brenner and Katsikis, 2020: 26). Consequently, what is taking place inside the box, i.e. how it evolves, its intrinsic political-economic operations, land-use dynamics, spatio-temporal dimensions, and socio-ecological crises, has attracted less attention. Thus, this literature contends that it does not suffice to simply construe the non-urban 'outsides' as a constitutive part of city-building processes yet still as an 'obscure background to the study of contemporary urbanisation' (ibid.: 27). Accordingly, this perspective calls for a systematic rearticulation of the hinterland question in urban studies.

Inspired by these accounts, I seek to contribute to this rearticulation by zooming in on and unpacking the black box of contingent temporalities of water scarcity in Lusatia and the implications these contingent temporalities have for Berlin's future. I do so by broadly referring to contingency as a process of how 'things, spaces, and places could always be *otherwise*, but also *elsewhere* or *elsewhen*' (Landau-Donnelly and Pohl, 2023; 488; emphasis in original). With regard to the contingency of the hinterland, I am particularly intrigued by its ever supportive yet simultaneously unsettling function for urban life. AbdouMaliq Simone's account of 'negative potentiality' between the periphery and the centre is useful for the purpose of my endeavour. Simone finds that even though the periphery is instilled with a sense of insufficiency and incompletion, remaining dependent on the generosity and guidance of a centre, it is 'never really brought fully under the auspices of the logic and development trajectories that characterize a centre, and therefore embodies an instability that is always potentially destabilizing of that centre' (2007, 462). Consequently, concentrating on the contingency of the hinterland brings into view how these 'operational landscapes of planetary urbanisation' (Brenner and Katsikis, 2020) hardly provide stable footing for territorial development and, in the case of Berlin, ecological security. But, within the context of worsening ecological preconditions of water security in the region, this also exposes local territories and communities to increasing risk. To scrutinize how this contingency unfolds through time, next, I mobilize literatures on hydrological time and uncertainty in times of climate change.

## Hydrological time and uncertainty

In the Lusatia Lake District, set to become Lusatia's post-mining landscape after centuries of coal extraction, all clocks have become obedient to the temporalities of water: Erratic rainfall, groundwater that is not rising at the anticipated speed, and the river Spree carrying less water than projected are all unsettling the region's hydrological balance. This hydrological time, determined by non-linear environmental changes rather than policy timelines with deadlines, forecasts, and fixed horizons, places a fundamental uncertainty at the heart of the linear long-term planning of the Lusatia Lake District. This situation burdens the hinterland with a double role, as it is unclear at what speed the post-mining lakes will be filled, but it is also uncertain how the hinterland will continue to supply Berlin with sufficient drinking water. Consequently, contingency not only destabilizes the temporal and epistemic scaffolding of future-making in the region but also embodies a sense of ambiguity, as decision-makers must steer towards an increasingly unclear future, where visions diverge, predictions are delayed, and responsibilities more and more fragmented.

Urban political ecology literature has been of immense value for outlining how water scarcity is socially produced by uncovering the intricate relations between social and natural worlds (Bakker, 2003; Heynen et al., 2006; Meehan, 2014; Loftus and March, 2019; Anwar et al., 2020; Millington and Scheba, 2021). Yet it has given less consideration to the role of time in the social production of water scarcity. To fill this gap, I draw on recent geographical and anthropological interventions on 'environmental time' in the context of climate change. These literatures have paid particular attention to the ambiguities climate change–related uncertainty holds. Evidently, climate change introduces unprecedented radical uncertainties, such as unforeseen disasters, erratic weather, or escalation in climate variation (Mehta et al., 2019). However, given the multifarious causes and consequences of these uncertainties, some may require no action at all (if considered to pose no risk for the time being), while others are deemed so risky they require immediate action at any cost, prompting community responses, activating emergency policies, and sometimes even pushing local communities towards illegal activities (Ahmed et al., 2019). Urban uncertainties are thus experienced and addressed differently depending on their causes and the actors involved. They may reflect the lived reality of the urban poor, a governance challenge, an economic opportunity, or a space for political engagement (Zeiderman et al., 2015), and they may relate to unpredictable futures or to obscured responsibilities for past climate degra-

dation (Ley, 2021). Related to water in particular, Zeke Baker, Julia Ekstrom, and Louise Bedsworth develop a theory of 'social temporalities' that weaves together the material environment of water management with analyses of the social practices of futurity (2018: 420). Similarly, Teresa Cavazos Cohn, Kate Berry, Kyle Powys Whyte, and Emma Norman take seriously the material environment for structuring temporal orientations of actions, exploring how spatio-temporal cycles mark the complexities of space and time in tribal water quality governance (2019).

Building on these works that address the junction between, in my case, hydrological time and the ways uncertain futures are enacted, I expand upon this literature to explore the multifarious ways actors mobilize 'time perceptions', i.e. different perceptions of time by social actors that have emerged in the climate emergency (Hanusch and Meisch, 2022). Doing so throws light onto the ambiguity that is inherent in the contingent temporalities of the hinterland. Next, I demonstrate how they play out in Lusatia.

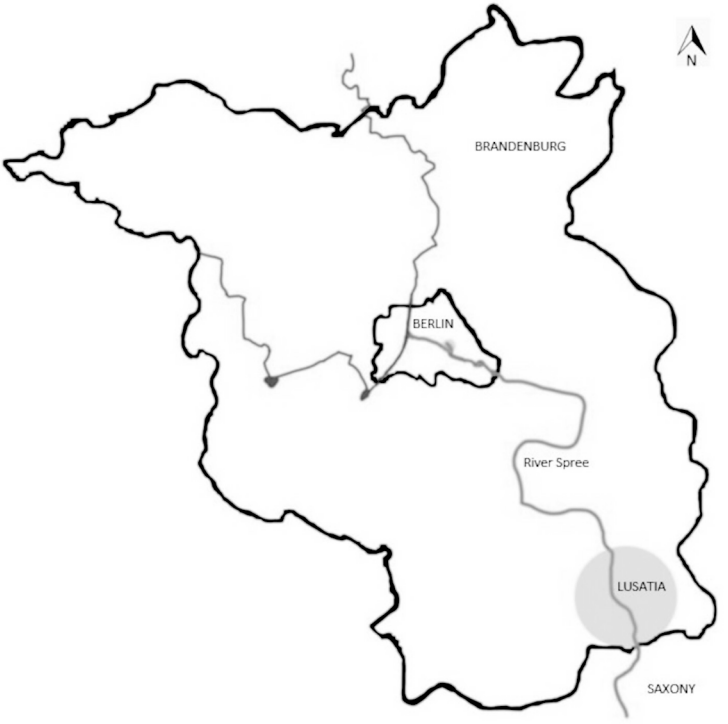
## Opening the black box of the hinterland: The Lusatia Lake District

To scrutinize the contingent temporalities in the planning for water scarcity in Berlin's hinterlands and the ambivalent time perceptions that emerge as a result, I first introduce the methodological basis of this chapter before presenting the background of the case. I build on qualitative case study research (Yin, 2014) conducted between 2023 and 2024. After an initial analysis of regional and urban development plans in Berlin and Lusatia, as well as newspaper articles, reports, and policy programmes, I then conducted and used data from 15 semi-structured interviews with infrastructure planners, regional planners, hydrologists, government officials from municipalities and the federal state of Brandenburg, former employees of the mining company, and environmental activists from organizations campaigning around the issue of water. The interviews lasted approximately 1.5 hours each and were conducted in person or via online video meetings. My analysis followed the principles of qualitative content analysis (Mayring, 2000).

In public discourse, Lusatia is often portrayed as a successful model of post-mining recultivation. The LLD carries weighty symbolic value regarding Germany's *Energiewende*, symbolizing the federal government's effort to phase out coal by 2038 as part of its Climate Action Act (Bundes-Klimaschutzgesetz, KSG) (Bundesregierung, 2024). Once an important energy centre of the former

GDR, the rural region in eastern Germany stretches across the federal states of Brandenburg and Saxony (Figure 1). Located about 1.5 hours by train south-east of Berlin, it covers an area of 13,000 square kilometres and is home to 23 lakes. Mining activity peaked during the GDR period, and it was during this time that the recultivation concept of transforming former mines into recreational lakes was conceived (Sullivan, 2016). After German reunification in 1990, control of the mines was transferred to the LMBV federal mining agency and to private companies. Since 2016, the Lusatia mines are owned by Czech investors, who now manage them under the LEAG Group.

*Figure 1: Map showing Berlin, the river Spree, and the Brandenburg part of Lusatia.*

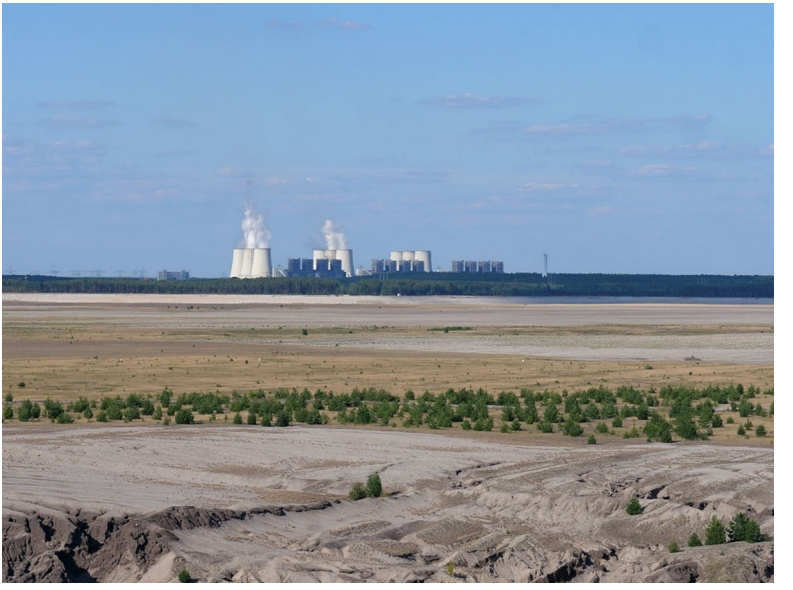



Source: Linda Rauch.

## Water scarcity as a 'temporal challenge'

In this section, I am concerned with the way in which the temporalities of water scarcity complicate this regional vision in the hinterland, the uncertainties that emerge from such temporalities, and the implications these uncertainties have for the future of Berlin's water supply. To make sense of this enigma, I specifically focus my analysis on one artificial lake, the Cottbuser Ostsee, a pertinent example for illustrating Lusatia's water-induced hinterland temporalities (Figure 2). Spanning 19 square kilometres, this lake is intended to be the centrepiece of a broader urban development project, which includes plans for a marina, residential neighbourhoods, sports and wellness facilities, a hotel, and commercial areas in the city of Cottbus (Cottbuser Ostsee, 2025b). A small city of approximately 100,000 inhabitants, it is situated near to the lake.

*Figure 2: Cottbuser Ostsee before flooding was started in July 2019, showing a coal plant in the background.*



Source: Leonhard Lenz CC 0 1.0.

Originally envisioned in a 2006 master plan, the development aims to establish a new tourist destination for the region. However, the timeline for the lake's usability remains uncertain. Although induced flooding began in 2019 and concluded in late 2024, it was repeatedly interrupted by four consecutive years of drought and high evaporation rates. These inconsistent water levels also triggered hazardous landslides along the shoreline. While exceptionally heavy rainfall in 2024 allowed the lake to reach its target water level of 62.5 meters, recurring droughts are expected to cause further fluctuations, raising increasing doubts about the project's long-term viability (Schibilsky, 2024).

But why is the temporal dimension so vital for understanding the logics of the hinterland? A joint statement by the federal states of Berlin, Brandenburg, and Sachsen published in 2022 to address growing concerns around the region's water shortage announces: 'The federal states are of the opinion that the adaptation of water management is a decisive element of the structural change process and that an earlier coal phase-out poses a particular temporal challenge' (Sächsische Staatskanzlei, 2022). Importantly, the statement's emphasis is on the 'temporal challenge' of water. This is because, on the one hand, the statement hypothetically cautions that a hypothetical 'premature coal phase-out' (referring to considerations by the federal government to exit coal even before 2038) will cause the expected water deficits to occur much earlier. On the other hand, the statement also underscores that 'between 15 and 20 years of planning and authorization time are missing for the proper clarification of water management issues. The investigations and measurements now have to be carried out in a much shorter time' (ibid.). Put simply, federal state decision makers stress that the predictive models and calculations of future water scarcity necessary for scenario building and water management concepts do not exist and that the time required to produce them is existentially delaying any solution that might be put into place. And why is that?

## Contextualizing today's water scarcity historically

To fully grasp today's situation in the LLD, it is insightful to reflect on how cities in the former GDR were long characterized by an overcapacity of water infrastructures. Following reunification in 1990 and the abrupt transition of state socialism to a capitalist economy, a severe drop in consumption caused major problems for the technical functioning and viability of water infrastructure systems (Haug, 2004; Moss, 2008; Naumann and Bernt, 2009). This drop can be explained by the phenomenon of 'shrinking cities', which has character-

ized the post-socialist transformation of many former East German cities and regions, caused by depopulation and economic decline (Kabisch et al., 2010). Against this backdrop, water consumption in the new federal states and Berlin dropped by 41% between 1990 and 2004 (Moss, 2008).

Yet, these drastic socio-economic changes have led from a situation of overcapacity to one of scarcity. While plans for establishing the LLD originated in the era of overcapacity, today Lusatia constitutes one of Germany's driest regions, with a growing gap between declining supply of and rising demand for water due to the influx of new populations and growing industries that are being established as part of structural change policies, such as a new large railway depot, factories for electric batteries, and smaller tourism settlements (IHK, 2025). A local infrastructure planner describes how this change requires a complete reorientation in water management: 'The demands on water management are very different from what they used to be. In the past, we had to protect against flooding, […] now all we do is retention. That's a completely new approach that you have to get people's heads around first' (interview W04, 2023).[2]

The issue of water scarcity thus presents a growing concern among local communities in Lusatia (Radtke and David, 2024: 5). Initial scenarios project that during dry summer months this will entail up to 75% less water than 2023 in the river Spree (which both provides the Cottbuser Ostsee with fresh water and constitutes Berlin's main supply of drinking water) (Umweltbundesamt, 2023). This is owing to decades of mining and surplus water resulting from it, which was discharged into the river Spree, leading to an enormous groundwater deficit while simultaneously increasing the river's volume. The pumping of groundwater will gradually cease with the end of mining, eventually resulting in rising groundwater levels again – which is set to take decades. Thus, it is expected that water deficits in the region will not be countered by conservation alone (Umweltbundesamt, 2023).

Overall, the LLD has long symbolized Germany's sustainability transition. However, the region's shift from water overcapacity to scarcity is significantly undermining this vision, disrupting local development plans around the lakes. Debates over solutions remain contentious, as some reject the idea of

2 References have been anonymized to the following code: W = water. The abbreviation is followed by a number that lists the interviews chronologically, producing a unique code for each interview partner.

lake flooding entirely, while others advocate for large-scale infrastructure projects as a way forward.

## The contingent temporalities of the hinterland

While it already seems distressing that the livelihoods of local communities are increasingly at risk in the face of uncertain future water supplies for the flooding of lakes, this situation becomes complicated by taking a closer look at the hinterland's entanglements with the city of Berlin.

### Diverging visions

Within Berlin's 'Water Master Plan' (Masterplan Wasser) (Berlin, 2024), a chapter of considerable length is dedicated to highlighting the importance of improved multilevel governance, and particularly collaborations with the neighbouring state of Brandenburg in order to counter the looming water shortage. Essentially, this need is deduced from the need to collectively model water forecasts. However, the master plan is curiously illustrated with an image of this city-hinterland relation, portraying the river Spree as flowing flourishingly in Brandenburg's green and lush landscape, leading up to the city, which is set in grey tones in the background (Figure 3). This city-centric vision not only shows how the hinterland is suffused with the centre's imaginaries (Simone, 2007: 463) but also underlines the ideologies of nature underpinning urban sustainability policies (Wachsmuth and Angelo, 2018). In temporal terms, this vision suggests nature's infinite, endless supply of water in service of the city.

From this Berlin-centred perspective, it indeed seems unreasonable for Brandenburg to hold onto the vision of LLD, suggesting that peace would be restored if only it adjusts to this interpretation of their relations, letting go of the idea of the lake district in order to sustain a never-ending water supply for the capital, thus providing a stable footing for Berlin's ecological security. In this vein, the head of supply at Berlin's water operator questioned Brandenburg's decision to flood the mines entirely in a recent newspaper interview, highlighting the danger of furthering Berlin's water shortage through the huge evaporation surfaces the lakes offer (Rada, 2024).

*Figure 3: Image in Berlin's 'Water Master Plan' depicting city-hinterland relations.*

Source: Berlin 2024.

However, juxtaposed with the present situation at the Cottbuser Ostsee, where policymakers and local communities worry about the economic future after coal, due to the region's uncertain hydrological future (which puts into question the realization of the lake district), these same actors' future vision is associated with a seemingly finite time frame brought about by water scarcity. This finite time frame is expecting water to run out, calling for a decidedly different set of interventions, including the development of new large-scale infrastructure projects to transfer water from other catchment areas, as I will explore in a later section.

Contrasting these different time perceptions of endless and finite time frames in the diverging visions of the city and the hinterland thus testifies to a sense of ambiguity when it comes to foreseeing a future solution to the issue of water scarcity. This ambiguity asserts how the pursued stability of the hinterland (i.e. the flooding of the lakes for economic gains) is potentially

destabilizing for the centre (i.e. realizing the hinterland's vision of the lake district at the risk of increasing Berlin's water shortage).

## Delayed predictions

To scrutinize the contingent temporalities of the hinterland that emerge from water scarcity and the implications these hold for Berlin, it is furthermore informative to uncover how these temporalities come into being through delayed predictive models, uncertain forecasts, and bifurcating time perceptions. As I have outlined previously, the biggest obstacle for ensuring safe and continuous water supplies for both Berlin and Lusatia are uncertain predictions on future water availability as well as unclear rises in demand. An initial study undertaken by the Federal Environment Agency (Umweltbundesamt) in 2023 projected that the drinking water supply in the greater Berlin area and in the river Spree is at risk of major shortages. The river may, in the future, carry up to 75% less water compared to the time of measurement in 2023; this will particularly be the case during dry summer months if, with the end of lignite mining, much less groundwater is pumped into the river than before (Umweltbundesamt, 2023). However, this constitutes a rough estimate, and the study concludes that an adequate data basis is still missing, calling for a sound data model to inform future decision-making. The agency's rather bleak forecast is regularly downplayed by the mining company, which has celebrated the complete flooding of the Cottbuser Ostsee in 2024 as a significant success (Cottbuser Ostsee, 2025a).

But why is measuring the looming water crisis so delayed, contested, and unclear? Many interviewees emphasize that the issue has simply been neglected for far too long. As one infrastructure planner put it, 'nobody was thinking about the issue of water. It is only now slowly getting attention in public debate' (interview W06, 2024). Additionally, and crucially, most of the necessary data is in private hands, namely with the mining company LEAG, rendering it difficult for public authorities to produce forecasts (RBB24, 2023). The federal states of Berlin and Brandenburg are currently developing a joint water scarcity strategy, set to be announced in 2025 (Staatskanzlei Brandenburg, 2023). This is meant to provide a data basis for measures to counter water scarcity, such as a transfer pipeline for water from the river Elbe. Additionally, Brandenburg and Saxony are collaborating with the federal government to create a groundwater model by 2027, which will inform future decision-making (Brandenburg, 2024).

However, this unclear data situation gives rise to bifurcating interpretations and time perceptions in the hinterland. Concerned about the flooding of lakes and its consequences for the tourism sector, municipalities in the region have issued a joint statement in response to the Environment Agency's report, declaring that 'further delays in fundamental decisions must be avoided at all costs' (Lausitzrunde, 2023). Considering the relevance of water for new industries, a representative of the local Chamber of Commerce in Cottbus seconds that, adding that new industries 'are increasingly aware of the issue and checking water availabilities on commercial sites before deciding to locate' to Lusatia (interview W14, 2024). However, he stresses that, as of now,

> it's all a forecast, and as we know, forecasts are sometimes uncertain. […] This lack of data is a real concern for companies […] This uncertainty, I think, is relatively high. Hmm. And then, um, how do you currently [i.e. without a data basis] guarantee water supply for industries and commercial locations? (ibid.)

Companies, too, perceive governmental action on dealing with the issue as not fast enough, slowed down by a data collection process that should have been carried out years ago, and thus call for more immediate action and the development of public water management concepts to solve the water crisis (interview W14, 2024). Similarly, a civil servant of Brandenburg's Ministry of the Environment (MLEUV) in charge of hydrology underlines the uncertainty of the situation but defends the fact that it is taking years to develop water models, warning that the uncertain situation could be instrumentalized by different actors:

> But the problem is that many things are unclear. And because they are unclear, they are or can be used by different camps to fuel or support their own interests. And that always makes it difficult. So, if you have a good data basis on which you can build reliable statements, that's always the best thing, and that's what we're working on right now. (Interview W05, 2023)

The way these actors address this uncertainty differently makes for fragmented responsibilities with ambivalent consequences, as I will explore below.

## Fragmented responsibilities

Against this backdrop of diverging visions and delayed predictions, environmental activists argue that the vision for the LLD is no longer certain, and they are actively campaigning to halt current plans to fill the lakes (Schuster, 2022: 10). In contrast, government authorities, and particularly the state of Brandenburg, continue to support the vision, with several initiatives underway to address water scarcity. The key study by the Federal Environment Agency, already mentioned, recommends upgrading dams and water reservoirs, as well as expanding existing artificial lakes to serve as water basins (Umweltbundesamt, 2023). Moreover, among its more contentious proposals is the idea of transferring water from other catchment areas, such as the river Elbe. Several of my interview partners, including federal states and the mining company, considered this 'Elbe pipeline' the most promising solution, though it would require years of legislative approval and construction. But planning authorities are hesitant, awaiting the predictions of water models currently being developed.

However, these speculative solutions that are currently on the table also give rise to contingent temporalities, unfolding through actors' varied time perceptions between acceleration and hesitation. An alliance of environmental NGOs calls for 'accelerated planning so we can get started' to tackle the region's water crisis and views its role as 'constantly pushing' public authorities to quickly implement solutions (interview W07, 2024). They favour investments in new big infrastructure through water pipelines from the river Elbe. Crucially, the alliance claims that the delay in decision-making is due to failed governance between regional and national governments and the mining company, stating that those actors have long wasted time as 'nobody felt responsible' for this task that would 'take years or decades and cost an incredible amount of money' (interview W07, 2024). Curiously, the mining company is now benefitting from this sense of urgency, which it uses to heavily advocate for building the proposed pipeline to channel water from the river Elbe (interview W04, 2023). Publicly financed, this major infrastructure project would provide an inexpensive solution and 'way out' of the company's responsibility to provide financial resources for recultivating the mining landscape, as interviewees explained (interview W01 2023; interview W06, 2024).

Agreeing with this narrative of acceleration thus risks skewing decision-making towards the mining company's own economic rationales. Crucially, this goes back to a law – Section 55 of the German Federal Mining Act (Bundesberggesetz, BBergG) – that obliges companies operating open-cast mines

to pay for the costs of recultivation following depletion, following the so-called 'polluter pays principle'. Yet, how this law is implemented in practice remains highly dubious: Mining companies themselves are responsible for estimating the future follow-up costs for recultivating depleted mines, and publicly reconstructing these costs remains difficult (Oei et al., 2017). The pipeline is justified as a forward-thinking technological success story, although this narrative leaves out environmentally destructive consequences that might emerge from it or elsewhere.

Due to these dynamics, the infrastructure planners I interviewed call for slowing down, fearing the pipeline would be too quick a fix to a complex hydrosocial problem requiring much more holistic thinking. A local water infrastructure planner states that the discussions around solving the water crisis in LLD is too human-centred, believing that 'everything can be bent to our technical needs, like flying to the moon' (interview W06, 2024). Correspondingly, someone else declares 'yes, many people prefer the technical solution. And in this respect, the transfer is certainly the more convenient solution. But in the long run, you have to ask yourself whether it is the better solution' (interview W15, 2024). In a conversation I had with Berlin's water planners, their perspective sides with critics of the pipeline project, but they also did not want to make definitive statements until presented with the results of the groundwater models expected in the coming years.

## Fragile city-hinterland futures

To conclude, I have argued that Berlin's looming water crisis cannot be fully understood without looking beyond the city limits. Berlin's future water supply is tightly entangled with the city's hinterland, Lusatia, which is currently undergoing profound structural change due to the coal exit, resulting in the transformation of former coal mines into the Lusatia Lake District and the concomitant development of new industries and economic developments. Zooming in on this hinterland, I have laid out how water scarcity is socially produced, complicating these plans, bringing uncertainty not only to Berlin's future water supplies but also to the LLD's future.

Engaging with literatures on the contingency of hinterlands and water as a temporal factor, I have attempted to throw light onto this enigma by tracing the contingent temporalities of the hinterland and their plural time perceptions by different actors, thus stressing how the specific rhythms of the hinterland are

shaped by ever-changing, situational, and often uncertain conditions. These contingent temporalities unfold, first, through diverging visions between the city and the hinterland, whereby the city envisions the role of the hinterland to be the provider of endless flows of drinking water and the hinterland is more concerned with the immediate threat of not enough water for realizing its vision of the LLD (for a more extended analysis of why the region is holding onto these 'futures of the past', see Nettelbladt, forthcoming). Second, contingent temporalities come into being through delayed predictions, indicating that the extent of the situation is not yet predictable, due to a socially constructed lack of data, which is the result of the non-existence of models and of the ineffective public-private interface with regard to data availability. This lack creates uncertainty that is addressed in a variety of ways, according to each actor's specific interests. Thus, and third, I have shown how this gives rise to a variety of speculative solutions to the problem at hand (most notably a water transfer from the river Elbe), and to the creation of facts (as lakes are filled up before it is clear whether this is a sustainable and environmentally just solution). These different approaches are equally rooted in contingent temporalities, unfolding through actors' varied perceptions of time, between acceleration and hesitation, ultimately demonstrating how this leads to fragmented responsibilities and claim-making between city, regional, and national governments, environmental activists, and the mining company.

These findings point to a fragile and increasingly untenable foundation for Berlin's water future, one that continues to rely on a hinterland that is undergoing deep environmental and socio-economic transformation. As Lusatia navigates the uncertainties of its post-mining trajectory and confronts its own water scarcity, Berlin's expectation of steady, extractable flows appears misaligned with Lusatia's increasing uncertainty. The temporal dissonances and competing visions between city and hinterland expose how this fragile future is marked by a fundamental ambiguity: The pursuit of stability in the hinterland, most notably through the rapid flooding of lakes to spur economic gains, potentially undermines water security in the centre. In other words, efforts to stabilize the periphery may actively destabilize Berlin.

At the same time, the hinterland itself is shaped by plural, and often conflicting, development logics that appear ill-equipped to respond to the rapidly changing environmental situation. Visions of economic revitalization through lake tourism and new industries continue to follow linear, future-oriented planning trajectories that presume the availability of water as a stable and manageable resource. This reveals a troubling disconnect between

long-standing imaginaries of regional transformation and the unpredictable hydrosocial realities now unfolding. Rather than recalibrating in the face of growing uncertainty, authorities in the hinterland seem to double down on speculative promises of progress, creating facts through premature flooding and postponing necessary structural adjustments. Time will tell if this leads to further inertia.

What we can learn from the case of Berlin is that accounting for the 'contingent temporalities of the hinterland' is thus vital for opening its 'black box'. Doing so offers a promising entry point for rearticulating the hinterland question in the 21st-century context of looming environmental breakdown (Brenner and Katsikis, 2020) through highlighting its intrinsic temporal dimensions. Grappling with the ever 'negative potentiality' of the hinterland (Simone, 2007) through emphasizing hydrological time reveals a productive focus that has thus far been neglected in urban studies but appears to be an indispensable task as cities around the globe face a growing climate change–induced 'tragedy of water' (GCEW, 2023), resulting in existential hydrological challenges for human and non-human environments alike. Not relegating the hinterland to the 'obscure background' of contemporary urbanization (Brenner and Katsikis, 2020: 27) is of utmost importance in this endeavour. A truly holistic effort in responding to water scarcity in cities must take seriously its interdependent relationship with those non-city spaces sustaining it across administrative boundaries but must also bring the contingent temporalities of the hinterland centre stage. This will, at first, expose the fragility of city-hinterland futures but potentially also open up possibilities for reimagining their contingent waters in more equitable and environmentally just ways.

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