

# Blurring the shoreline: De- and re-infrastructuring and the changing colors of European flood policy

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## Abstract

This paper provides a genealogy of the emergence of a common EU flood policy, including the scope and direction of this policy. Noticing how EU policy proposes green infrastructure (associated with using nature as a buffer zone in managing floods) as an alternative to grey infrastructure (implying fixed installations of concrete and cement), this paper adopts the theoretical lens of the so-called infrastructural turn, which advocates a relational investigation of infrastructure. By engaging this approach, the paper shows how flood infrastructure can contain very different compositions of (unruly) water and (settled) land. A narrative of a historically strong focus on guarding society from the powerful forces of nature through a fixed line of defense is increasingly giving way to more muddy states—quite literally—where society is expected to learn to live with flooding and show ecological consideration. To capture the EU's, and especially the European Commission's efforts to establish a pan-European flood infrastructure that accommodates this turn, the concepts of de- and re-infrastructuring are developed. These concepts act as heuristic devices to capture how policy performs some combinations between water and land as constituting an attractive and functional flood infrastructure, but constitutes other infrastructural relations of the aquatic and the terrestrial as undesirable and, hence, as malfunctioning. This performative act of distinguishing between what constitutes “good and proper” versus “bad and undesirable” infrastructure is referred to as a politics of infrastructure.

## Keywords

European Union, Floods Directive, green infrastructure, grey infrastructure, infrastructuring, make space for water

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## Introduction

On the surface, it seems to be a simple task to draw a boundary between water and land—between where the river runs and where there is dry land. Pursuing a clear demarcation between wet and dry has been a particular focus in the case of flood control. In this context, patrolling the line between the aquatic and the terrestrial frequently means building flood defenses that involve constructions such as dams, dykes, and levees. However, as this study on the emergence of a common EU flood policy will argue, things have taken a different direction. The protection from flood that is provided by so-called grey infrastructure (i.e. associated with concrete and cement) and the promise of maintaining a watertight compartment between water and land have increasingly lost their attraction. Instead, EU flood policy promotes ways of dealing with floods that appear to be the opposite of dividing water and land. In connection with the popularized policy idiom of “making space for water,” the EU has adopted a transboundary risk management approach that opens the way for floods to be accepted on the grounds that they have been proactively managed, and that further advocates environment-friendly “green infrastructure” including wetlands, riverbeds, and salt marshes as buffer zones for flood waters. Accordingly, EU policy promotes the notion of granting space for water in ways that replace the idea of a fixed line between water and land with a blurring of the boundaries between (unruly) nature and (ordered) society.

This paper provides a genealogy of the emergence of a common EU flood policy, including the scope and direction of this policy, and how it is premised upon a (re)negotiation of the proper composition of water and land. To capture this shift, this paper will analyze the originating policy around the 2007 commencement of the EU Floods Directive (FD; Directive 2007/60/EC) under the responsibility of the Directorate-General for Environment (DGE). It will do so by adopting the lens of the so-called infrastructural turn (Giddens and Sutton, 2013: 235; Graham, 2010; Harvey et al., 2017). In contributing to this emergent theoretical framework, the heuristic concepts of de- and re-infrastructuring will be developed to capture how EC policy devises an emerging version of European flood infrastructure through a performative act that positions existing infrastructure as failing.

The infrastructural turn is guided by the recognition of the vital role of infrastructure in the ordering of our world through space and time. According to the infrastructural turn, infrastructure should be understood as an important part of the very backbone of society, rather than being treated as a mere *backdrop* to society. Thus, advocates for the infrastructural turn consider that it is insufficient to merely acknowledge the important role played by infrastructures by highlighting their impressiveness; rather, they must be unpacked to make visible their political nature and societal interdependencies, that is to make visible the politics of infrastructure. Pursuing infrastructural visibility is hence not about creating bedazzlement, but about preventing infrastructure from escaping critical scrutiny (Star, 1999), for example by not allowing infrastructure to comfortably remain within the purview of engineers and policy experts. Viewing infrastructures in this way refutes their consideration as discrete and neutral entities, and rather addresses them as heterogeneous amalgamations existing “[b]etween nature, culture, society, technology and politics” (Graham, 2010: 10).

To investigate such heterogeneous amalgamations, the focus will be on how EC policy alternates the composition of water and land, in realizing a new version of flood infrastructure along Europe’s rivers and sea stretches. A perhaps obvious reason for this focus on the compositions of wet and dry is the very fact that human interest in floods derives from hazardous encounters between unruly water and settled land. This makes flood

infrastructure an obvious mediator between nature and society. However, it is also true that flooding—like almost any other present issue—is nowadays permeated by environmental concerns, be it climate change and the acceleration of sea levels, biodiversity loss, or toxic spillage. In this context, infrastructure is intricately staged—sometimes cast as guilty of environmental degradation, but also frequently promoted as the proposed savior. Such varying and oscillating positions are highly visible in EU flood policy, in its shift against grey infrastructure and its acclaim of greener substitutes. The entanglement of infrastructure and the environment has not passed unnoticed by scholars with an infrastructural interest. Thus, these scholars have extended the argument “that infrastructures do not mirror social relations, but rather reconfigure them” to include the reconfiguration of nature too, pointing out infrastructural arrangements as significant in definitions of what constitutes “nature” and the “social” (Jensen and Morita, 2017: 618).

This understanding of infrastructures—along with a consideration of the associated environmental entanglements—therefore enables investigations that go beyond viewing infrastructures as mere static background, but rather open up an analysis of the continual intertwinement and performative effects of infrastructures. In this context, the study of policy processes can provide very fertile ground for learning about such developments, because although policy work often looks mundane (and perhaps even boring) to outsiders, it involves making official the political justifications for infrastructural actions that should take place. Hence, whereas Blok et al. (2016), drawing on Erving Goffman, urge us to go backstage to be able to uncover the technical, ethical, and political choices that infrastructures are composed of but that frequently disappear out of sight, this paper goes “frontstage,” so to speak. Scrutinizing the political moment when the establishment of a common EU flood action was at the center of EC policy makes it possible to observe the performative work that is being done to (re)configure the policy’s acclaimed “good and proper” composition of nature and society, in the pursued shift from grey to green infrastructure, that is to observe the politics of infrastructure. To capture the performative process of negotiating infrastructural value, which demotes the convention of fencing water away by means of hard defenses in favor of establishing an infrastructural shift that promotes granting water space through softer approaches, this paper adds to the theoretical apparatus of the infrastructural turn by developing the concepts of de- and re-infrastructure. These concepts are used as heuristic devices to comprehend the attempts of EC policy to realize a flood infrastructure built upon transboundary risk management, including proactive measures, and to take ecological consideration by performing predominant infrastructure as provincial, too costly, risky, and—not least—unsustainable.

The next section details how the policy material analyzed in the empirical subsections was derived. This is followed by a brief genealogy of the emergence of softer and greener flood risk management approaches, situating it in a European context by considering the examples of the Netherlands and the UK. Thereafter, the fundamentals of the FD are explained in order to familiarize the reader with what EU flood risk management entails, and how it differs from mere risk calculation, for example. Furthermore, the formal justification of a common EU approach to floods is explained. The next two sections expand on the infrastructural turn and its theoretical premises, and on the concepts of de- and re-infrastructure. The subsequent four subsections pick up where the brief genealogy ended, and expand on it by analyzing how EC policy has acted to establish a transboundary EU flood infrastructure that highlights the forging of new compositions of water and land. The first of these four subsections analyzes how rising water as a matter of national infrastructural planning is argued to be a historical fallacy, which frequently only results in water causing trouble somewhere else, that is in other EU member states. Determining this shifting

of water to be a disloyal act, EC policy considered it logical to position flooding as a transboundary issue in need of pan-European measures, since the flow of water is stated to have no respect for national borders. The second subsection investigates the introduction of risk management in the context of EU flood action. It delineates how floods have increasingly been positioned as being about accomplishing societal awareness, as policy denounces trust in “hard” defenses to keep water out, and instead opens the way for an acceptance of floods on the grounds that they have been proactively supervised, that is “managed.” The third subsection studies the spatial effects of not settling for a fixed line of defense that separates water from land but instead establishing societal acceptance of living with floods, and examines how this view opens the way for societies that are designed to incorporate flooding as part of their terrestrial world. The fourth subsection looks at the greening of flood infrastructure and the demoting of grey defenses, which entail the EC identifying grey infrastructure as environmentally unfriendly and as disfiguring nature. Instead, the EC positions green infrastructure as a more desirable alternative that involves building upon nature’s capacity to absorb water, and that is guided by the flow of water, and hence casts green infrastructure as something that improves ecological sustainability. The ending concluding discussion stresses, among other things, how EC policy de-infrastructures grey infrastructure by determining it to be non-working because it is too fixed and solid, and not adaptable to present time, allowing only binary demarcations between water and land. By instead emphasizing the need for more mutable and porous solutions for handling floods—not least due to the increasing ecological and economic cost of disrespecting nature and the flow of water EC policy is re-infrastructuring flood actions to contain EC’s desired version of how to handle floods in the 21st century.

### **Gathering of the empirical material**

The empirical data for this paper’s four empirical subsections were found through the EC’s dedicated webpage on flood risk management, which is administered by the DGE (EC, 2019b). Charting the webpage and headers such as “Floods Directive,” “Key documents,” “Preparatory processes,” “Directive implementation,” and so forth allowed me to gather a stock of empirical material for further close reading. The header “Better environmental options” contained documents and links on the DGE’s work around biodiversity, natural retention measures, and green infrastructure. Following the clickable link on “Green infrastructure” directed me to the webpage for the EU’s (2013) strategy on green infrastructure. Furthermore, following the header “Links” on the flood risk management site routed me to the EC’s webpage, “Adapting the management of Water and Environmental Resources in response to Global Change,” where the EC (2009) white paper *Adapting to climate change* was found.

### **A brief genealogy of soft flood risk management**

Flood risk management, in terms of a shift away from hard measures and the advocating of a more considerate relationship toward water, is not an invention of the EU. Although the full genealogy of this concept is difficult to trace and lies beyond the scope of this study, some comments can help the reader to situate the developments discussed in this paper. First, as Wesselink et al. (2015) describe, the impetus behind “soft” flood risk management is found in many countries around the globe, albeit with differences in composition between contexts. Second, several concepts emphasizing changes in the relationship between water and land are in circulation. For example, the UK and the Netherlands—one of which is almost completely surrounded by water while the other largely exists below sea level—have,

respectively, adopted the spatial concepts of “make space for water” (Department for Environment, Food and Rural Affairs, 2005) and “room for the river” (Ministerie van Verkeer en Waterstaat, 2007) to address floods—both idioms have been used by the DGE (2011a, 2011b). These two countries can thus serve as examples of the spatial embeddedness of softer flood risk management approaches. Bergsma (2018) defines the international development of flood risk management as a move away from focusing on the separation of water from land and toward a greater emphasis on minimizing the resulting impact from flooding, and explains its introduction in the Dutch context—a nation that for many years was almost exclusively locked in a strong safety mode. Tracing the first spatial shift in ecological concerns in the 1970s, which was due to environmental damage from building flood defenses in ecologically vulnerable areas, Bergsma argues that the 1990s saw increasing recognition of the large impact of climate change on flooding among Dutch engineers. As a result, the engineers questioned the feasibility of their usual response to the increased threats of flooding, that is to build stronger and higher levees. Instead, they began to promote the idea of providing room for rivers to flood and to address local problematic choices in spatial planning. Dutch policy soon followed suit, not least due to economic reasons associated with both building such defenses and paying for flood damages. This caused the “room for the river” policy to become an integral part of Dutch flood governance in 2006, and to come to a full circle, according to Bergsma (2016), gaining strength by the commencement of the FD. Butler and Pidgeon (2011) describe similar developments in the UK since the 1990s, as the British policy moved from a focus on flood defense to soft flood risk management and adopted the discourse of “making space for water.” These two concepts involve both an increased emphasis on spatial planning and strategies for working with natural processes to alleviate flood damages. Although Butler and Pidgeon describe how these changes have been connected to both catalytic flood events and an increased emphasis on sustainability in the UK, they view them as signaling a deeper shift in governance that involves the redistribution of responsibility from the state to flood-affected citizens, local authorities, private enterprises, and NGOs—developments that have also been discernible in the Netherlands (Bergsma, 2016).

Do these changes suggest the abrupt end of structural flood defenses? Hardly. Wesselink et al. (2015), Bergsma (2016, 2018), and Butler and Pidgeon (2011) all describe congruent developments toward soft risk management, but also agree that policy is one thing and what happens on the ground is another. Wesselink et al. (2015) discuss how lock-in effects such as a historic dependence on hard defense—highlighting the Dutch context as an example—make it difficult to easily shift to soft measures; they further emphasize the cost of claiming land to allow flooding, and report that soft approaches can be less popular with affected citizens. The DGE (2011a: 13) has also expressed the view that although it views nonstructural solutions as more flexible and sustainable than “hard” structural measures, it considers the latter to be imperative in certain situations, such as major floods. Hence, we are not witnessing the end of hard measures, but rather seeing efforts to open up a space for a shift in flood infrastructure: to set the scene for and make possible “softer” approaches by problematizing hard measures, making them questionable, and thus making alternatives possible. As will be explored in the following sections, European policy actors have come up with an arsenal of arguments and actions that contribute toward the questioning of grey infrastructure.

## **The Floods Directive**

The full name of the FD—namely, “Directive 2007/60/EC of the European Parliament and the Councils of the 23 October on the assessment and management of flood risks”—certainly demonstrates its risk focus. However, and importantly, this directive is about

both the assessment and the management of risk. Risk assessment and risk management are strongly associated with the turn toward risk governance, which extends the approach to risk from being confined to experts carrying out technical calculations, to include social, political, and communicative dimensions of risk, thus broadening the number of actors involved (Aven and Renn, 2010). When discussing the FD, Krieger (2013) argues that risk-based governance signifies both a general trend toward more accountable governance—exemplified by the directive demand that members make risk maps and management plans publicly available—and an increased responsabilization of citizens to manage risk (see also Butler and Pidgeon, 2011), that is citizens become responsible for drawing conclusions from the communicated maps and plans.

The directive stipulates that member states should carry out a preliminary assessment of the risks posed by floods throughout their coastal areas and river basins along the four dimensions of human health, environment, cultural heritage, and economic activity. The directive further emphasizes the importance of coordinating the measures of waters that are shared between countries. For areas where significant flood risk is identified, flood hazard and flood risk maps are required; the former show potential flood spread, and the latter represent the adverse consequences of a potential flood pursuant to the four dimensions. Flood risk management plans are subsequently developed, which stipulate how risks should be dealt with according to the dimensions of prevention, protection, and preparedness. The directive further stipulates that “[m]ember states shall encourage active involvement of interested parties in the production, review and updating of the flood risk management plans” and that preliminary risk assessment, hazard and risk maps, and flood risk management plans should be made available to the public (Directive 2007/60/EC article 10, paragraphs 1 and 2). The process follows a six-year cycle; as a result, once the flood risk management plans come into effect, the process soon starts over again. This may result in the identification of new risk areas or in the discharge of others, for example on the grounds that appropriate measures have been taken to minimize risk. The first cycle ended in 2015 and soon the second cycle is completed.

As previously mentioned, the FD is under the responsibility of the DGE. The juridical reason for this is that in justifying its right to act, the Commission (EC, 2006a: 11) chose to frame flooding as an environmental topic by referring to Articles 174 and 175(1) of the EU Treaty, which gives the EU the legal right to act on environmental policy issues. Furthermore, the design of the directive aligns with that of the environmental Water Framework Directive (WFD; Directive 2000/60/EC), which commenced in 2000. On its website, the Commission (EC, 2019a) describes the WFD as a response to polls showing water pollution to be one of the main worries among EU citizens. Although various EU legislations concerning water protection have been in effect since the mid-1970s, the WFD is designed to take a holistic approach, and involves all of the EU’s water bodies. The FD is also coordinated with two other environmental directives: the Birds and Habitats directives (Directive 79/409/EEC; Directive 92/43/EEC). Accordingly, the FD has a clear environmental profile and explicitly states in its preambles that it should promote “a high level of environmental protection in accordance with the principle of sustainable development” (Directive 2007/60/EC, preamble 22).

However, making the FD an environmental directive resulted in tensions between the Commission and member states. For example, one might easily question whether flooding would not fit better within the DG European Civil Protection and Humanitarian Aid Operations. During the FD’s initial negotiations, for example, Sweden complained that the directive could force organizational changes around the responsibility for floods within the country. Sweden was not satisfied until the directive text was loosened,

such that it did not stipulate that the FD had to be under the responsibility of the same national governmental body that organized the work around the WFD (Sveriges Riksdag, 2006). As a result, the Swedish Agency for Marine and Water Management (which answers to the Ministry of the Environment and Energy) coordinates the WFD, but the Swedish Civil Contingencies Agency (which is under the command of the Ministry of Defense) is responsible for the FD. Such discussions reveal some of the novelties of the FD in terms of its environmental framing, as well as displaying existing ambiguities around the nature of water in the case of floods.

## Infrastructuring

The infrastructural turn brings an increased focus on the large efforts that are required in order for numerous actors to build, maintain, and make use of infrastructure; this focus is sometimes emphasized by turning the noun *infrastructure* into the verb *infrastructuring* (Bowker et al., 2010). Obertreis et al. (2016) point out that in this line of thinking, infrastructures are analyzed as being composed by all sorts of entities, such as regulatory frameworks, cultural norms, environmental flows, and governance forms (to name just a few) “that [are] configured in particular ways” (Obertreis et al., 2016: 172). Thus, the focus on infrastructure as heterogeneously configured assemblages, rather than as confined structures, reveals a commitment to extend infrastructure, in its analyses, from being a thing to be about relations (Larkin, 2013). This shift efficiently prevents us from stopping our investigation of infrastructure in front of the power outlets in our homes, or just following pipeline connections, and instead encourages us to analyze infrastructure as part of something that extends well beyond such installations.

However, this argumentation is not an attempt to strip the significance of the physical features of infrastructures. Edwards (2003: 200) asserts that infrastructures are conceivably more about sociotechnical institutions than about large technological systems, implying that some infrastructures rely relatively little on technology—much as the juridical or educational systems contain but are not composed of technology. Still, infrastructures are frequently about material matters. The solidification of, for example, metal and concrete often brings about the very concrete effects that are usually considered to be a defining feature of infrastructure: the ability to ensure connections and mobility by being fixed and immobile (e.g. roads provide structure for cars, wires provide a path for electrons, and piping provides a route for water). Nevertheless, it is similarly important not to be misled by such apparent fixity. As Howe et al. (2016: 533) argue, the physical solidity, durable functioning, and generative effects of infrastructures are often momentary because infrastructures not only degenerate, become in need of upgrading to meet new demands, and collapse but they also encapsulate a certain societal and political moment, which will ultimately pass and be replaced by others.

Today’s political moment is undoubtedly guided by environmental concerns on an unprecedented level that permeate almost all issues, and infrastructure is no exception. This necessitates extending the discussion of the physical features of infrastructure to include nature. The encounter itself between infrastructure and the environment is obviously not something new. Infrastructure frequently stretches across the landscape, whether in the form of pipelines, airplanes, or high-voltage transmission lines. However, scholars have also shown how humans incorporate landscapes and waterscapes as constitutive parts of their infrastructure. For example, Carse (2012) notes in a study of the Panama Canal that the environment around watercourses, such as farmlands and forests, is sometimes enrolled as part of the infrastructure for water storage and flood alleviation. Here, then, nature is

absorbed as a functional part of society and is harnessed in the service of society. Jensen (2015) writes about nature being technologically shaped and transformed into infrastructure, which blurs any distinction between the natural and the technological (Harvey et al., 2017: 9).

Such blending points to the heterogeneous configurations of infrastructures, where nature and society fold into each other to form hybrids, and where what counts as which becomes blurred (Blok et al., 2016). Moreover, these hybridizations involve methodological considerations. Harvey et al. (2017) state that the question “what is infrastructure” cannot be answered beforehand. Instead, they argue for empirical experimentation on what is an infrastructure, along with analytical conversation on a conceptual level. The answer to their rhetorical question of whether, for example, the environment is embedded in infrastructure or the infrastructure is embedded in the environment, becomes an open one. Larkin (2013) reminds us that any answer to such questions depends on analytical choices, that is on which network of relations one chooses to investigate as infrastructure. Choosing to focus on flood infrastructure makes it inevitable that the relevant network comprises the borderlands of the aquatic and the terrestrial. This in-between positioning further acknowledges the call by Blok et al. (2016) to study the intersection between infrastructures and environments from “the middle out.”

In contemporary times, this intersection critically concerns the fears of both environmental degradation and the intensification of the forces of nature, as in the case of climate change. In this pressing situation, the entanglement of infrastructure and nature is not only about infrastructural harnessing, or about infrastructure crossing through the landscape, but it also involves attempts to preserve and guard environments from ecological damage. As discussed in the previous brief genealogy of flood risk management, the same environmental concern has entered the discussion about flood infrastructure. Thus, today’s flood infrastructure should increasingly contain both the capability to prevent water from creating destruction and death, and the ability to preserve the ecological status of water, including its surrounding environments.

The environmental concerns of the present thus remind us of Howe et al.’s (2016) argument that infrastructures are the outcomes of specific social and political moments and are therefore “incapable of forever satisfying the tasks they are meant to carry out” (553). When translated to flood infrastructure, the strong safety mode associated with the epoch of modernity has today encountered a different reality, in which new tasks have emerged for flood infrastructure to handle. Therefore, what is considered working flood infrastructure is not necessarily the same thing it used to be, as the boundaries of terrestrial protection of society seem to blur when aquatic protection is also taken into consideration.

## **De- and re-infrastructuring**

The change in what can be considered as working flood infrastructure can be used as an illustration for a conceptual argument in this paper, which attends to the workings and failures of infrastructure. Regarding infrastructure failure, Larkin (2013: 336) argues in a seminal review paper on infrastructure that it seems to have become obligatory for studies within the infrastructural turn to follow Star (1999: 380) and to state that infrastructures “only ‘become visible on breakdown.’” However, this paper wishes to counter this assertion by empirically arguing that actors’ dissatisfaction with infrastructure can make them initiate *a process of making infrastructure visible* as something that is breaking down in various ways. That is to say, by referring to current infrastructure as something that, for example, has failed, has become insufficient, or is at risk of falling apart, actors can create very



fertile—and perhaps even necessary—ground for promoting alternatives to the existing order. In emphasizing failure, as well as success, as not factual matters but performative effects, this paper adheres to the science and technology studies (STS) literature, in which the question of whether or not a technology “works” is not considered a matter of inherent properties, but is instead viewed as an emerging quality (Petersson, 2011: 45). Rather, STS scholars (Bijker, 1995; De Laet and Mol, 2000; Latour, 1987) argue that both functioning and failed technologies are the outcome of situated efforts through space and time that involve a range of heterogeneous entities, and that what is functioning in one context might very well be treated as malfunctioning or breaking down in another. As Bijker (2007) exemplifies in the case of floods, different countries build their flood defenses to withstand different flood scenarios according to different technological cultures, thus, a working defense in one country might be considered a deadly threat in another.

This view of how to understand what is working and what is non-working translates directly to the issue of breakdown, failure, and what constitutes working infrastructure that is discussed in this paper. Hence, I argue that the efforts to demote existing grey/hard flood infrastructure as outdated, as well as the similar exercise to establish a greener and softer flood infrastructure as a better functioning alternative, involve infrastructural work of a performative kind. Thus, the question of what constitutes working infrastructure should encompass is by no means self-evident, and the question of what defines malfunctioning infrastructure is likewise not self-evident. Instead, this matter is about the politics of infrastructure—or, in other words, engagements regarding “how to infrastructure.” It is about simultaneously managing to perform a certain order (or chaos) in the world and to devise an infrastructure that is able to contain and endorse this version of the world. As the empirical subsections will highlight, in performing this work, policy actors assemble heterogeneous relations in such a shape that the outcome of their work makes visible existing flood infrastructure as variously lacking in transnational solidarity, being environmentally unsustainable, being non-economical, threatening to collapse, and so forth, and as therefore necessitating reconfiguration in order to be able to accommodate new demands and expectations. As such, the performance of making grey infrastructure visible as a failing solution for the future—enforced by policy writings, the ratification of directives, the execution of financial calculations, the introduction of flood risk maps, and so forth—destabilizes its prominent role in handling floods and merges into a concerted tool for enacting a specific logic of what flood infrastructure should really be. I will refer to this performative act as a way of de-infrastructuring, which is a process of disassembling infrastructural arrangements by staging these arrangements as composing malfunctioning infrastructure that cannot complete its tasks. In the most extreme case, this could result in the abolishment of the infrastructure. More moderate de-infrastructuring, however, is about creating a new version of the existing infrastructure. This might involve cutting off some elements of the heterogeneous network from their supportive infrastructural role, and demoting entities to positions that are more peripheral by rearranging infrastructural relations. It is the more moderate kind of de-infrastructuring that is foregrounded in this paper; rather than abandoning flood infrastructure, the focus is on reconfiguring it, as infrastructures based on concrete slabs, defense walls, levees, and so forth are persistently downgraded, which destabilizes this infrastructure into a failing version of itself. I further argue that this process is interwoven with a performative act of re-infrastructuring, whereby infrastructure is recharged with new essence and content. This process works just the same as de-infrastructuring, albeit in the opposite direction. Accordingly, re-infrastructuring involves pursuing the realization of an infrastructure that incorporates new scope and direction by performing a shift in the ecology of the relations constituting the infrastructure in question,

and generating a different version of it. Here, the process of de-infrastructuring can act as a contrasting shadow that brings an aura of innovation to the process of re-infrastructuring. In the case of an emerging common EU flood infrastructure, it comprises appeals for ecological consideration and making use of nature as a buffer zone for flood water, by constituting grey infrastructure as the complete opposite to such approaches and as something that is therefore unaligned with the present.

The performative emphasis of de- and re-infrastructuring further differentiates them from other scholarly approaches that capture the breakdown, failure, and workings of infrastructure, which focus on the very physical attributes of infrastructure. The arguably most popular approaches are the hermeneutic concepts of ruins, repair, and maintenance, the latter two of which are often used in combination (e.g. Denis and Pontille, 2015; Howe et al., 2016; Jackson, 2014, 2016; Ureta, 2014; Yarrow, 2017). Thus, in the case of ruins, scholars attend to “the physical articulation of a failed utopian vision of the promise of abundance under industrial capitalism” (Miller and Garcia, 2019: 5) by visiting and exploring the actual sites of rusting metal and broken bricks left behind where industries and infrastructure once prospered (DeSilvey and Edensor, 2012). Similarly, repair and maintenance stress the artificial by emphasizing a focus on the actual mending, tweaking, and patching required keeping computers, electric grids, roads, and so forth functioning (Graham and Thrift, 2007). Jackson (2016) further adds to the significance of interaction with the material at hand by insisting on the importance of builders, maintenance, and concierge workers in the repair and maintenance of infrastructures. As explained earlier, de- and re-infrastructuring are not reducible to such material distinctiveness. In this view, breakdown is not necessarily defined by the material collapse of infrastructure (although it is certainly possible). Hence, neither the failure nor working of infrastructure can be limited by this performative approach to the operation of cogs, wheels, and wires or to the persistence of steel and concrete. Instead, as an interest in things is extended to investigating “relational quality” (Star and Bowker, 2006: 231), failure and working become effects of heterogeneous braiding. Furthermore, while de-infrastructuring may capture the processes of decay and debris that are associated with ruins, re-infrastructuring moves away from the past; thus, the concept of re-infrastructuring furthers the analysis of future-oriented transformation and even metamorphosis, leading beyond the mere “sustain” mode (Jackson, 2016: 170) of infrastructure that is implied by maintenance and repair.

## **Mobilizing multipurpose and fluid flood infrastructure and the disengagement in fixed and single-purpose alternatives**

With this preoccupation with infrastructuring, brief genealogy of soft flood risk management, and significance and content of the FD in mind, this paper now turns to its four empirical subsections and corresponding analysis.

### *European floods and EU flood infrastructure: From local floods to transnational coordination*

Jackson et al. (2007) argue that infrastructures are often under the command of the state, but that their strengths frequently stem from their ability to bridge nation-defined infrastructural compositions. Arguing along similar lines, the Commission’s justification for suggesting a joint EU action flood program in 2004 was built upon an expansion of flooding into a transnational challenge. In its proposal on a directive on floods that was finalized in 2006, the Commission stated that floods cannot be handled by individual member states,

as “[r]ivers and regional seas are not confined inside existing geo-political boundaries, instead most river basins and coastal areas are shared between various countries” (EC, 2006b: 6).

In this redefinition of member states’ sovereignty of their waters into waters that are best handled in a concerted manner by the EU, the Commission similarly redefined flood infrastructure from a mere local issue into a common concern for the EU. According to the Commission, a reason for this concern was that unfortunately, the existing protective measures were often built to safeguard a certain stretch of land, resulting in an upstream–downstream division. Thus, local flood protection commonly leads to a quick evacuation of water masses from one area, but create a “knock-on effect” downstream. Hence, the Commission declared: “Therefore it is imperative that flood protection is dealt with in a concerted and co-ordinated manner along the whole length of the river” (EC, 2004: 2).

The logic advanced by the Commission in its call for a common EU strategy on floods proposes that society’s administrative boundaries should be replaced by the boundaries of nature, allowing the flow of water through river basins to order these matters, instead of having individual member states resort to national solutions. In EU policy, the river basin unit was first established through the WFD; it was defined as “the area of land from which all surface runoff flows through a sequence of streams, rivers and, possibly, lakes into the sea at a single river mouth, estuary or delta” (Directive 2000/60/EC article 2, paragraph 13), a definition that was later adopted by the FD. However, the widespread international adoption of the basin as the logical center of action has been criticized. For example, scholars have argued that “nature” does not easily conform to human definitions of basins, that basins are frequently already engineered, and that the recourse to nature and the basin as the natural scale and unit of water effectively turns water issues into something that is apolitical, without recognizing that not all issues fit basin borders (Warner et al., 2008: 123). Nevertheless, making water the mandatory connection between administrative and political bodies is indeed a political act with a capital P, as it moves flood infrastructural issues toward Brussels and reframes them from the pure concern of individual countries into issues that are preferably handled through an alliance between member states with coordination that is overseen and regulated by the Commission. Through this co-constitutive act by the Commission, “natural” borders trump the administrative and political boundaries of states; thus, it becomes logical to argue that regional flooding politics should be subsumed under a common EU flood policy based on river basins, thereby acknowledging water’s disrespect for national borders.

Whereas the nation state’s building of dykes has been explained as acts of solidarity that solidify the welfare state’s responsibility around floods (Hartmann and Spit, 2016, drawing on Barraque, 2014), the new transboundary waterscape opens up a different interpretation. Flood defenses that are built by member states without taking an interest in the defenses’ effect elsewhere would be positioned as part of a flood infrastructure built around egoism, and possibly even as a breach of the treaty of the union. The latter possibility is a consequence of the Commission’s principle guidelines, which state that flood risk management should adhere to one of the EU’s founding principles: the rule of solidarity, in which both advantages and burdens are shared between member states. Consequently, the Commission went on to state that no flood protection should be built that could compromise other regions or member states (EC, 2004).

Thus, the EC is de-infrastructuring current flood infrastructure as too local, and instigating a re-infrastructural process by arguing for the advantage of a common EU flood infrastructure for the purpose of improved coordination. The Commission is working to loosen previous political and administrative boundaries; instead, it wishes to see regional

and national actors coming together across the web of waters connecting them. It advocates the re-infrastructuring of flood actions on a European scale through the “Europeanization” of flood issues, as domestic flood policies should align to the proposed EU directive (Paul et al., 2016). This act upgrades national waters into EU water and downgrades national flood infrastructures into failed projects. In this emerging European waterscape, water is considered to be the very constitutive force that pulls administrative and political units into a new European flood infrastructure assemblage. Existing flood infrastructures that instigate fear of overflow in neighbors are simultaneously declared to be non-working options.

### *Managing flood risks: From hard to soft technologies*

Flood protection such as dams, dykes, and levees strongly builds upon a flood infrastructure logic that promises to protect society from floods by maintaining a sturdy line of defense against water. This “hard engineering” premise has been undermined. Within EU policy circles, flood defense constructions are nowadays being positioned as fragile human enterprises, instead of being the vanguard of modernity. Wesselink et al. (2015: 27) note that the shift from flood defenses toward risk management involves downplaying hard engineering solutions; it also means that whereas “management” indicates that control is still possible, the addition of “risk” implies “that there is always a residual risk and that fail-free ‘defense’ is impossible.” Correspondingly, EU policy recognizes that flood defenses are by no means an assurance against disaster, making it dangerous to think of such defenses as providing safety. In terms of risk management, this reasoning according to EU policy makes it necessary to be proactively prepared for situations in which no defense walls may exist.

For example, in the Commission’s proposal for a concerted EU action program on flood risk management, the first sentence under the headline “Diagnosis of the problem” already frankly states that flooding may occur “when flood defenses fail” (EC, 2004: 2), thus showing little trust in flood defenses as a guarantee of safety. Accordingly, the very practice of walling in water, and its associated assurance that flooding has now been prevented, has become inherently associated with uncertainty and hazardousness. For example, Wetmore (2007) wonders whether one reason for the impact of the New Orleans flooding was that too much focus was directed toward using the protection of the levees to safeguard the city, instead of preparing for a situation in which they failed. This focus may have created a “false sense of security” (Wetmore, 2007: 123) that resulted in disaster once the construction collapsed. Similarly, the annex to the Commission’s proposal for the FD (EC, 2006a: 8) states that if communities and cities under the threat of flooding too rarely experience overflows, their interest in maintaining flood defenses and upholding preparedness decreases. A solution to this problem is to force societies to imagine what would happen if their defense structures broke down. Hence, the Commission’s proposal argues that member states should work with a minimum of three levels of risk scenario: (a) areas with frequently occurring flood events; (b) areas with less frequently occurring flood events; and (c) “Very rare flood events, including where appropriate dyke failures” (EC, 2004: 11). Leaving the responsibility for handling floods to defense structures is evidently not good enough, and is argued to undermine peoples’ alertness. Instead, the Commission asks for a framework that contains risk scenarios in an effort to make the possibility of flooding more visible and to create preparedness for situations in which dykes break down.

The European Council further weakened the concept of a fixed line of defense when it chose to make changes in the Commission’s directive draft to avoid promising protection. Instead of flood risk management plans containing a “desired ‘level of protection,’” the European Council ensured that the directive stated that the plans should only establish

objectives, “thus accepting that it may not be possible to guarantee a specific level of protection in the light of unpredictable natural hazards like floods” (EC, 2006c: 7). The annex to the Commission’s proposal for the FD also declared that a certain risk might have to be accepted in some cases “because the costs of providing protection would be disproportionate to the benefits” (EC, 2006a: 15).

The acceptance of flooding is further evident in the directive’s actuarial risk calculation. The formula states that flood risk means the probability of a flood event (i.e. possibility of flooding) *together* with the potential adverse consequences (i.e. impact of flooding) (Directive 2007/60/EC: article 2, paragraph 2). Consequently, the focus is on lowering a flood’s impact (on human health, the economy, the environment, and cultural heritage) by using the flood risk management plan as an instrument to decide to what degree flooding is acceptable—rather than on preventing flooding *per se*.

The fallout of how to handle the flooding appearing in these policy documents is that flooding cannot be reduced to something dangerous “out there”—unruly nature, so to speak—on the other side of a constructed dam or dyke. Instead, EU’s policy position resembles Hilgartner’s (2007: 153) assertion that “[t]here are no natural disaster only sociotechnical ones,” which emphasizes that (possible) disasters in today’s advanced technological societies are frequently subsumed under an array of risk management practices, and that disasters very much emerge from the sheer complexity that is built into our heterogeneous networks of systems and infrastructures. In a similar manner, the Commission so to speak “socializes” floods by stressing the frailty of flood defenses and questioning their promise to keep water out of society; instead, it asks that floods be “managed,” which includes ways that open up an acceptance of flooded societies. This is the de-infrastructuring of flood infrastructure that has been built upon a fixed line of defense and that promises safety, and re-infrastructuring through flood risk management and the acceptance of variable levels of risk. This process of de- and re-infrastructuring performs a shift that devalues trust in the ability of flood defenses to shield citizens, while simultaneously retreating from guaranteeing (costly) protection from floods. Instead, it introduces risk management and the acknowledgement that societies may sometimes be flooded, but that their exposure to water has been proactively dealt with through the establishment of instruments such as flood risk management plans. The annex to the proposal of the FD expressed this view in terms of the importance to move “from flood defense to flood risk management [where] [f]lood risk management implies that flood risk will be managed well before, during and after a flood event” (EC, 2006a: 15).

The turn toward the notion of risk management then introduces a whole new set of relations into flood infrastructure. The purpose and focus of flood infrastructure are transformed—from boxing water through “hard” technology (i.e. steel, concrete, and cement) in efforts to discipline water, to measures in terms of what Butler and Pidgeon (2011) label “soft” technologies (i.e. risk management), which instead emphasize attempts to govern human activity and conduct. As such, the re-infrastructuring that is imposed through the FD introduces a flood infrastructure that manages flooding by building what is increasingly designated as “social capacity” (Kuhlicke et al., 2011). It emphasizes reoccurring evaluations, planning, risk communication, and striving for participation by “interested parties,” including citizens. This sort of infrastructure opposes shielding people’s minds from the risk of flooding by hiding it behind structural means; instead, it works to create visibility and societal awareness.

### *A flood infrastructure that grants space for water: From a fixed line to spatial overlap*

The FD recognizes a conflicting dilemma that augments the effects of flooding. First, due to climate change, the adverse consequences of flooding are expected to increase; second,

human settlement and economic assets are growing in floodplain areas (Directive 2007/60/EC preamble 2). The consequences are that water is moving closer to human activity, be it through increased precipitation or permanent changes in sea levels, and human activity is moving closer to the waterfront. In this escalating flood scenario, if the EU demotes (too-costly) flood infrastructure inscribed with the promise of separating water from land and instead opens the way for flooding to be accepted, there will be a need in the EU's turn toward risk management for a flood infrastructure that can cope with futures in which water and land may increasingly overlap.

Flood infrastructure built upon flood defenses that push water away has made it possible for society to expand: Dutch water engineering and its “battle against water” (Wiering and Immink, 2006) is perhaps the prime example of this. However, the acceptance of living without a guarantee against flooding has made way for the opposite position, namely that society should allow water to expand. This “approval” of water shows up in the FD itself, which says that flood risk management plans should have in view “giving more space for rivers” (Directive 2007/60/EC preamble 14). Hence, granting space for water embodies a flood infrastructure in which it is not always water that gives way to land and that acknowledges that water should not consistently be contained, but should also be allowed to (over) flow. This perspective necessitates the reconsideration of areal use and planning in terms of what parts of the land will be allowed to be flooded in the case of rising water. As Roos et al. (2017) have pointed out, the FD asks for the impact of water and land policies to be considered when determining flood risk, and asks that both soil and water management and spatial planning and land use be taken into account in flood risk management plans. The Commission's suggestion to think in terms of multilevel risk scenarios, which was later formalized by the directive (Directive 2007/60/EC article 6, paragraph 3), also establishes the need for member states to avoid working with a fixed line of defense against water, but instead to work with various possible lines of flooding, thus pushing flooding into the domain of spatial planning (Hartmann and Spit, 2016).

This new orientation transforms the scope of flood infrastructure, de-infrastructuring solutions limited to the case of water engineering and the construction of vertical protection against water through dykes and walls, and re-infrastructuring flood infrastructure by encompassing spatial planning and horizontal issues around land usage as an important part of delimiting the effects of possible flooding. The FD accordingly establishes a situation in which the strong safety paradigm is pushed aside; instead, it seeks an openness toward flexible levels of dryness. For example, it approves the inundation of land zones within the risk maps, where the risks have been determined to be acceptable based on possible adverse consequences. This turn connects to the introduction of new flood actors through stakeholder participation in flood risk management, as discussed in the previous section: When an emphasis on walling floods out is replaced with the FD's legitimization to grant space for water, households, landowners, industry, farmers, road and electricity infrastructure providers, and so forth could end up in a situation in which flooding is the new normal.

In such an environment, with no promised levels of protection but with planning for differentiated levels of flooding, diverse and conflicting sets of interests and issues around water and land ownerships must be dealt with by spatial planners, as water management now includes looking “beyond the watercourses” (Moss, 2004: 88). Some of the implications of this situation—and the awareness that this might not be an easy task—are made visible by the DGE (2011a) in its argument that flood management necessitates spatial planning in the effort to give more “room for rivers” through relocation, reducing flood risk by setting aside land, and the possible removal of at-risk properties. The policy's denunciation of upholding a rigid line could be interpreted as giving back what was once won, where the

grant space for water position signals a retreat toward nature. It might further be perceived as a continuation of the policy of keeping a strict line between water and land, which this time expands the former's territory in favor of the latter, for example by requiring spatial planning to allow for what the FD refers to as the "controlled flooding of certain areas" (Directive 2007/60/EC article 7, paragraph 3). However, it is also possible that the outcome of a flood risk management plan process opens a path for the exploitation of land that was previously deemed to be impossible or impracticable to keep dry—and that was therefore considered to be inappropriate for exploitation—due to the way in which flood risk management introduces an acceptance of flooding. For example, the DGE (2011a) emphasizes enhancing society's capacity to "live with floods" by constructing properties that are built to cope with flooding. Such actions align with what has been summarized in the environmental policy research literature as "moving from protection to retreat," along with the need to build a capacity to "accommodate" water within society (Verschuuren and McDonald, 2012).

Giving room for water in this way introduces an infrastructural response to how societies should cope with floodwater when an infrastructure built upon defenses that fix water inside its watercourse is no longer the obvious and prime option. It establishes a base for a re-infrastructuring that is built upon approaches to flooding that admit water's expansion and make use of various mixtures of water and land. In the process, it de-infrastructures flood infrastructure that focuses on clear separation by pushing water away. Sanctioning inundation thus transforms the very nature of what flooding is (Donaldson et al., 2013), as it permits a flood infrastructure that works to redefine the proper place of water in case of overflows and that may accept the presence of flooded streets and neighborhoods, and—in the case of buildings designed to cope with flooding—sometimes even flooded properties.

### *Toward a yet soggy state: From grey to green flood infrastructure*

As mentioned earlier, the FD is an environmental directive. Although the significance of the environment is obviously visible in the directives' demand that the environment should be addressed as one of four dimensions in the course of flood risk management, the environmental scope has taken on a direction that manifests itself in the very composition of flood infrastructure.

Accordingly, not only is the environment to be protected but it should also be put into service to relieve society from the effects of flooding, something that has been captured in EU policy by references to "green infrastructure," which is therein used as a label to re-infrastructure flood infrastructure on ecological grounds. The concept of green infrastructure has gained particular attraction in the US and the EU, and although it is described as an ambiguous concept, its practical adoption in water and flood management is claimed to have heavily influenced the evolution of the concept (Salomaa et al., 2017: 266). The EU's strategy for green infrastructure defines it as "a strategically planned network of natural and semi-natural areas with other environmental features and managed to deliver a wide range of ecosystem services" (EC, 2013: 3). Green infrastructure is furthermore a part of the Commission's white paper titled "Adapting to climate change," which explains that "working with nature's capacity" can be more efficient than "simply focusing on physical infrastructure" (EC, 2009: 5). For example, green infrastructure is presented as something that can be utilized to prevent flooding by improving both the soil's capacity to store water and the ability of natural systems to conserve water. Existing flood defenses are exemplified as the opposite—as "maladapted" by disturbing the "natural dynamic nature of coastal and river systems" (EC, 2009: 6), and thus as affecting the environment in negative ways that counteract flood mitigation. Moreover, the de-infrastructuring of existing flood defenses as

eco-unfriendly makes way for the promotion of green infrastructure on economic grounds. For example, the abovementioned ecosystem service concept is built upon a transferal of the ecological dimension into economic value, which calculates a monetary value for human health gains and attractiveness for entrepreneurs (Salomaa et al., 2017: 278). Thus, apart from EU policy drawing upon updated calculations that show flood defenses to be less economically viable in hindsight, new economic models have assisted policy actors in placing an economic value on things that were previously difficult to capture in terms of monetary means, such as recreation, pleasantness, and aesthetics, which are said to benefit alternative types of flood mitigation (DGE, 2011a: 13–14; Wood and Gendebien, 2005).

Ergo, EU flood infrastructure should defend the environment against the sheer quantity of water that can damage wetlands and biodiversity, while simultaneously protecting the very quality of water from the possible release of toxics and wastewater (EC, 2006a: 23). However, new infrastructure should also be designed to avoid inflicting environmental harm or worsening the costly effects of flooding (which now include ecological dimensions and “soft” values). In this eco-policy context, the building of dams, dykes, weirs, levees, and so forth emerges as less of a solution than as part of the problem. This repositioning of flood infrastructure is also made visible in the Commission’s work around the FD, in line with what scholars have recognized as being part of the “greening” of flood risk management (Werritty, 2006). For example, in the annex to the Commission’s FD proposal (EC, 2006a: 8, 10), human actions are identified as responsible for increasing the impact of flood damage not only by deforestation, river straightening, and damaging flood plains, but also by building flood defenses that are said to disrupt the ecosystem. In opposition, and in line with the concept of green infrastructure, the annex argues for measures that grant space for water by using flood plains and wetlands to help mitigate flood effects and that can simultaneously work to improve biodiversity and habitats while reducing toxic runoff and erosion. Similarly, the directive says that in their efforts to reduce flood risks, member states should focus on “appropriate...nonstructural initiatives,” and that flood management plans should take into account “areas which have the potential to retain flood water, such as natural flood plains” (2007/60/EC article 7, paragraph 2 and 3).

Whereas flood defenses have traditionally been built on floodplains with the purpose of excluding water, the above rearrangement of flood infrastructure and nature re-evaluates this practice. Instead, it proposes a flood infrastructure that includes water, for example by now using floodplains as retention areas and not as the building sites for “hard” protection. The DGE (2011b) lists numerous examples of such “best practice” projects around Europe, describing techniques such as extending the floodwater zone by increasing the floodplain area, blocking artificial drainage, and landscaping flood plains with vegetation and forestation in order to slow down water flows and improve water absorption.

This brings us back to the appropriate composition of water and land in the context of flooding. The use of flood plains as retention areas means that even though water can overflow land (and is sometimes even required to do so, as in the case of the wetlands protected by the Birds and Habitats directives, where recurrent overflows are a necessary condition), land should not be submerged for good. Instead, the aquatic and the terrestrial should mix and work together as flood mitigation buffers, while simultaneously healing nature by rehabilitating biodiversity and water quality. The DGE (2011a: 2) outlines this reorientation as part of a transformation from grey to green infrastructure, which reverts farmlands to flood meadows and restores the landscape in the form of wetlands, peatlands, forests, and floodplains by designing “multifunctional zones” that can serve multiple ends, for example, by both working as flood-resilient spaces and affording recreational value. Utilizing nature as flood infrastructure in this way involves shaping nature into an



infrastructural role by (re)designing the environment to include more artificial ways of mimicking certain desirable features that can work to mitigate flood risks, to slow down water, and/or to function as a sponge—in contrast to the inability of concrete to absorb water. Such approaches align with the views of environmental policy and planning scholars, who wish to see “transformative” flood concepts built upon green infrastructure and biomimicry as a more flexible response to flooding than relying on fixed flood defenses to dominate nature, or on approaches for “sequential land-use modes,” which are associated with the accommodation perspective (Lennon et al., 2014), discussed in the previous section.

Through EU policy’s alignment of flood actions and the environment, flood infrastructure is extended from marking a shift from “technical” to “social” capacity building, to include the support of nature. The shift toward green infrastructure incorporates the environment’s ability to assist in minimizing flood risks—while simultaneously facilitating improved water quality, biodiversity, and individuals’ appreciation of the beauty of the landscape—as an integral part of flood infrastructure. It is notable that this move does not imply leaving nature untouched. In this context, whereas portraying flood infrastructure as “grey” acts to de-infrastructure it as the color of humanity’s mark on nature, its greening is used to re-infrastructure it in an effort toward maximizing “Europe’s natural capital” (EC, 2013). In this setting, green infrastructure is about aligning flood mitigation with eco-friendliness and creating surplus value in the process, whereas grey solutions denote costly and “single-purpose” infrastructure (EC, 2013: 2). Here then, the sturdiness and fixation of grey infrastructure starts to work against it, as they become associated with being stuck in a moment that has passed by and with being incapable of taking on the multiple roles urged by the new “eco-nomics.” In this way, hard measures are efficiently de-infrastructured. This process works simultaneously to re-infrastructure the management of floods by means of green initiatives, performing them as the now “natural” and desirable alternative.

## Concluding discussion

The empirical sections of this paper have analyzed the disassembling of national flood defenses, including the dismantling of walls as a guarantee for protection, as well as the demotion of the concept of a fixed line of defense, as a matter of de-infrastructural work. Furthermore, the paper has also discussed the counter-process of re-infrastructuring that embodies the flow of water as the proper unit of action; the importance of societal preparation; and spatial planning that involves working *with* water, not least due to ecological concerns. We end up at infrastructure that involves knee-deep mud. In this endeavor, this paper has been guided by the infrastructural turn, showing by its submergence into EC policy and its infrastructural politics that although infrastructure might easily blend into the background, it is not to be thought of as neutral or passive. Moreover, it has been stressed throughout this paper that infrastructures should not be reduced to the fixity of the technical or material, as doing so risks constituting infrastructures as sturdy structures “by their own effort.” Instead, the emergence of a pan-European flood infrastructure has been considered as a relational process of infrastructural work. In this way, this paper has stressed that infrastructures are inscribed with assumptions, interests, and visions that intertwine the past, present, and future, thereby performing a certain ordering of the world and its preferable management—the politics of infrastructure.

In regards to EU flood policy, this paper has emphasized that such work involves the infrastructural embeddedness and braiding together of all sorts of heterogeneous entities, such as governing ambitions, engineering practices, economic calculations, hydraulic conditions, biological life, and the aesthetics and pleasantness of water. The assembling of this

composition involves choices that affect the very nature of flood and its associated infrastructure. These choices have been discussed through the lens of de- and re-infrastructuring as heuristic devices in order to pinpoint how European flood policy actors position and make visible some choices as part of a failing infrastructure, whereas other alternatives are favored as constituting a properly working flood infrastructure.

Furthermore, through the prism of flood infrastructure, this paper has consistently highlighted the transcendence of water and land into hybrid states, illustrating how historically cast boundaries are overstepped and new configurations are taking shape through processes of de- and re-infrastructuring. The arguably most pivotal of these boundary reconfigurations is the continual weakening of sturdy structures for handling floods, which involves replacing an infrastructural focus on fixity with a focus on a more fluid state. Now that flood policy has begun lose faith in the idea of separating the aquatic from the terrestrial, and instead endorses a connection between the two, the gap created by the removal of a dividing barrier is opening up a vigorous process of negotiation and proposition regarding how the emerging contact between water and land should be configured. The alternative would be to let water simply fill the gap and to allow it to flood as it pleases, thus making any flood policy irrelevant.

Although overflows are by no means given *carte blanche*, the policy problematization of flood infrastructure clearly involves a redistribution of agency toward the environment. The capacity of fixed lines of defense to protect from flooding is downgraded, and society is exploring a more generous and inclusive attitude toward nature, which involves policy affirmations regarding upgrading the status of water that are justified by both economic and ecological reasons in intertwining ways. This “powering up” of water conveys multiple transboundary reconfigurations that give shape and direction to the processes of de- and re-infrastructuring. Invoking the vocabulary of “giving space for water,” we see that apart from being granted physical space by designs and spatial planning that accept floodwater, water is claiming societal space in several ways, thus creating a mixture of water and land. The flow of water can be said to “approve” EU policy by trumping political and administrative boundaries; risk management aims to “make space for water” in our minds, in order to prevent it from being concealed by (risky) barricades; and the infusion of environmental concerns counterbalances the fear of the sheer quantity of water in favor of water’s life-sustaining and alluring qualities.

In this policy rendering of what proper flood infrastructure should be, dams, dykes, and levees not only have to fight off floods but they are also being attacked from behind, as policy increasingly chooses to identify with the position of water rather than with the practices, ideas, and orders that are embedded in grey infrastructure. In this setting, the construction of flood infrastructure entails absorbing water, spatial planning, social capacity building and, not least, an ecological concern, in ways that attempt to transgress the division between water and land that is associated with fixed structures. The physical and immutable solidity of concrete and cement is in this policy version becoming less desirable than the mutability and porosity of eco-alternatives. Here, hard engineering and grey infrastructure represent the amodern, whereas soft approaches and green infrastructure are performed as the future of today.

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