

F3-ROOM FOR RIVER



☐ Brad McKee ☐ Lisa Schultz ☐ Jennifer Reut ☐ Kat Katsma

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Caption:
The city of Nijmegen
during the digging of a
parallel river channel

ROOM FOR THE RIVER

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BY TIM WATERMAN

At the Boijmans Van Beuningen museum in Rotterdam, floated in a glass case, there is a painting on wood by Hieronymus Bosch titled *The Flood*. It was probably painted at the very end of his life, in about 1515, and it depicts Noah's Ark, finally grounded after the biblical flood, above a landscape strewn with corpses both human and animal, and all the detritus and muck that accumulates after an inundation. The surface of the painting is silvery and it is eroded at the edges, giving it something of the quality of driftwood, as if it had, itself, survived Noah's flood. The weathered surface also exhibits the veiled, aqueous quality of a world seen through cataracts, appropriate to a painting made by a man in his winter years. Despite this aging and blurring, the painting depicts, with jarring verisimilitude, an aftermath that seems to have been witnessed by the artist. The catastrophic St. Elizabeth's flood of 1421 occurred before Bosch was born, but it still lives large in Dutch memory, thus Bosch must have been very familiar with depictions of and stories from that flood. The most famous

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ROOM FOR THE RIVER

This map illustrates the 'Room for the River' program in the Netherlands, focusing on the Rhine-Meuse river delta. The map shows the course of the river from the north (Amsterdam) towards the south (the sea). Various project locations are marked with red dots, indicating current projects, and grey dots, indicating areas where additional water level reduction has been achieved through neighboring projects, making further implementation unnecessary.

Legend:

- CURRENT PROJECTS
- ADDITIONAL REDUCTION ACHIEVED IN WATER LEVELS FOR NEIGHBORING PROJECTS MEANS IMPLEMENTATION NO LONGER REQUIRED

Key Project Locations and Types:

- North (near Amsterdam):** ROOM FOR THE RIVER (ISSELDelta), DYKE RELOCATION WESTENHOLTE, FLOOD PLAIN EXCAVATION SCHELLER AND OLDENIELER BUITENWAARDEN, FLOOD CHANNEL VEESSEN-WAPENVELD, FLOOD PLAIN EXCAVATION BOELWERKSPAS, WOIPI AND OSSENWAARD, FLOOD PLAIN EXCAVATION DE TOLLEWAARD, FLOOD PLAIN EXCAVATION DOORWERTSCHE WAARDEN, FLOOD PLAIN EXCAVATION MIDDENLAARDE, FLOOD PLAIN EXCAVATION MEINERSWIJK, FLOOD PLAIN EXCAVATION HUISSENSCHE WAARDEN, FLOOD PLAIN EXCAVATION MILLINGERWAARD.
- Central (between Amsterdam and Rotterdam):** DYKE REINFORCEMENT LEX / BETUWE / TIJLIERWAARD AND CULEMBORGGERWAARD, FLOOD PLAIN EXCAVATION BOSSENWAARD, PONTWAARD AND HEERENWAARD, REMOVAL OF OBSTACLES ELST, FLOOD PLAIN EXCAVATION DE TOLLEWAARD, FLOOD PLAIN EXCAVATION MIDDENLAARDE, FLOOD PLAIN EXCAVATION MEINERSWIJK, FLOOD PLAIN EXCAVATION HUISSENSCHE WAARDEN, FLOOD PLAIN EXCAVATION MILLINGERWAARD.
- South (near Rotterdam and the sea):** DYKE REINFORCEMENT LEX / ALBLASSERWAARD AND VRIJHEERENLANDEN, DYKE REINFORCEMENT LEX / LOPELSWAARD AND KRAAMPENVERWAARD, FLOOD PLAIN EXCAVATION AVELINGEN, FLOOD PLAIN EXCAVATION RAUWENHUIZEN, LOWERING OF GROYNES WAAL, LOWERING OF GROYNES MID-WAAL, LOWERING OF GROYNES WAAL JORD ST. ANDRIES, DYKE REINFORCEMENT NEDERRIJN / BETUWE / TIJLIERWAARD AND CULEMBORGGERWAARD, DYKE REINFORCEMENT AMER / DONGE, DYKE REINFORCEMENT BERGSCHE MAAS / LAND VAN ALTENA, RIVER WIDENING OVERDIEPSE POLDER, RIVER WIDENING HUISSENSCHE WAARDEN, RIVER WIDENING MILLINGERWAARD, RIVER WIDENING HUISSENSCHE WAARDEN, RIVER WIDENING MILLINGERWAARD, RIVER WIDENING HUISSENSCHE WAARDEN, RIVER WIDENING MILLINGERWAARD.

A large area of wetland called the Biesbosch (“forest of sedges” or “rush woods”), which covers some 30 square miles (8,000 hectares) south of Dordrecht, on the estuary of the Meuse near Rotterdam, still remains as the legacy of that flood; the land has

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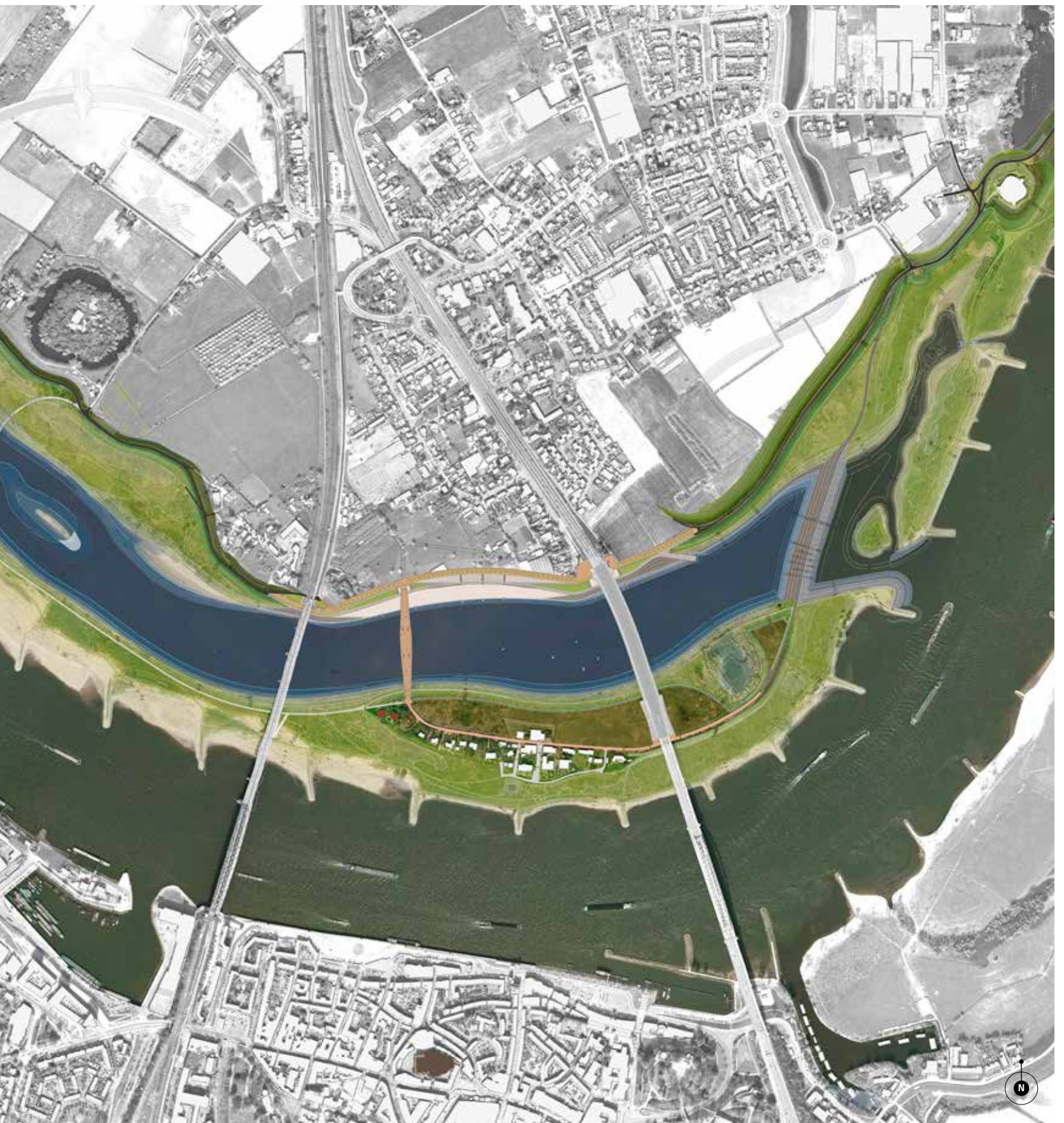
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the IJssel—in short, all of the rivers of the Netherlands, which together, in effect, make a vast estuary of much of the southern half of the country.

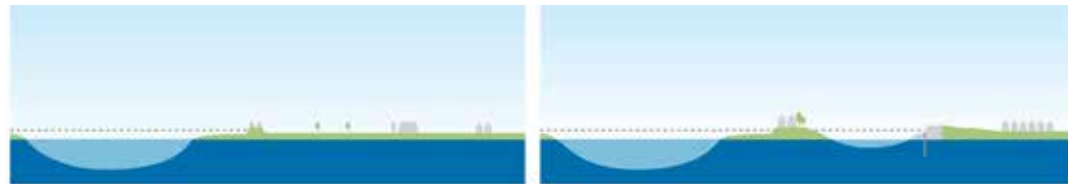
Room for the River is a landscape project on a scale—in terms of time, area, cooperation, and money—that is unprecedented in the United States. The impetus for the project began in 1993 and 1995, when flooding in the Rhine delta caused widespread damage. Some 250,000 people were evacuated along with thousands of cattle and other livestock, which caused a logistical nightmare, not just with moving and housing people, but with feeding and milking huge numbers of refugee cattle. In the earliest stages of Room for the River, in 2000, against the backdrop of major flooding happening in the United Kingdom, Hans Brouwer, a senior rivers expert with the project, went to Brussels to argue for the project at the European Union (EU). He presented a far-reaching plan for managed retreat, along with a wider package of plans for the channels and dikes of Holland's four rivers. The plan was a radical shift away from the traditional Dutch approach of creating harder, higher defenses in response to high water. In 2006, the Dutch Cabinet, to deal with future floodwaters, put forward the Spatial Planning Key Decision for Room for the River, which launched the project.

The project is framed within a very different structure of governance from the more traditional command-and-control models of the United States. First, there is the transnational view at the EU level, which prompts the consideration of large-scale landscape factors such as watersheds (Room for the River may eventually have impacts as far as the headwaters of the Rhine in Switzerland), and which is a source of funds. Secondly, Dutch governance in the past couple of decades has shifted radically from a state-centered approach to a much less hierarchical mode in which national





The newly opened river park on the Lent side of the Waal was designed by H+N+S Landscape Architects and features a broad slope that reaches into the river



government makes decisions in concert with local and regional government, institutions, and the citizenry. Initial resistance to this horizontalization of governance, which, admittedly, moves more slowly than the command-and-control type, has largely been overcome. Beside the fact that projects are brought to more satisfactory conclusions, people found that their jobs became much more interesting in the process. Projects are brought forward through discussion and negotiation, and everyone learns much more from talking to each other than they would from checking boxes on forms. Indeed, the sort of cooperation that was necessary to get Room for the River off the ground is probably simply impossible in more hierarchical systems. This process of governance over government, in which citizens help to define and solve problems, has also gone some way to address the problem of eroding trust in public officials and

The project features a new pedestrian and cycle bridge, the 'Lentse Cours' or 'Lent Runner' between the town of Lent and the new island of Veur Lent



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A new path is submerged at high water, though it is still possible to cross on stepping stones.

politicians, which is as much a Dutch problem as it is an American one.

As one might imagine, there is a close correspondence between water management and spatial planning in the Netherlands, and this was also necessary for the complex negotiations that were required to undertake the various elements of Room for the River. Among the measures included in the plan are the raising, lowering, placing, and moving of dikes, which in many cases has meant that farms and settlements have needed to be moved and resettled elsewhere. Polders, areas of low-lying, generally agricultural land that are protected by levees and have mechanically controlled hydrology mainly independent of larger systems, have been depoldered. Depoldering opens previously poldered land to periodic flooding in a strategy of managed retreat by lowering dikes, among

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The new river channel as it functions from low to high water. Note the 'comb' of groins on the south edge of the island.



other measures. Flood channels have been deepened, obstacles removed, river groins have been lowered, and a river bypass has been built on the River Waal at Nijmegen, near the German border. Where it has not been possible to find room for the river, dikes have been raised and strengthened. An oft-repeated analogy for the managed retreat approach is that traditional hard defenses are confrontational and percussive, like boxing, whereas resilient approaches to water management “go with the flow” of natural forces, like judo.

Nijmegen

The day I visit Nijmegen, there are shafts of silvery sunlight piercing brooding clouds over the town. Nijmegen is remarkable in Holland for being perched on a hill—not a massive one, but it takes very little in this flat landscape to make a striking prospect. Below the town is a whip-crack curve of the Waal, as it threads through the low hills

that spill over from Germany. The Romans, who often had an eye for beauty as well as defense, recognized that the narrow curve represented a good opportunity for both. This bottleneck, though, has also long been prone to flooding, and the Room for the River project has here been at its most ambitious, digging an extensive new river channel parallel to the original. The plan required extending the Waal bridge and building another large bridge, De Oversteek (The Crossing), as well as building a minor bridge to connect a small settlement at the inside bend of the river back to the small town of Lent, which looks up at Nijmegen from across the river. This settlement, just big enough to support a small café, now sits on a new island called Veur-Lent. Much of the island will be given over to a park, which will serve as a resource that will unite the town of Lent with its larger neighbor, and serve as a focus for a new housing development in Lent.

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The row of new terpen may be seen cutting diagonally across the aerial photo



Hooijmaijer's new farm, perched on its terp above the pasture



Incinerated postindustrial soil is imported to form the base of the terpen.

The scale of the project helped it attract European Union funding for research, communication, and knowledge-sharing networks as part of the FloodResilientCity program as well as for a program for studying water in rural areas called ALFA (Adaptive Land use for Flood Alleviation). The recognition that the project's significance is both rural and urban points to the fact that, in landscape architecture, urban planning, and civil engineering, Dutch practice is well ahead of the pack. Green infrastructure approaches have highlighted the need to remove artificial distinctions and barriers between city and country in spatial planning, but in America progress in this regard has been slow, hindered by an overwhelming

focus on the urban that has lasted for decades. Rural landscapes are the next great frontier for American landscape architects, and Dutch practice points to ways that this work might be organized and, as important, funded.

Displays of funding largesse, even in the Netherlands, can be tricky. The authorities in the town of Nijmegen are worried that the new bridge over the Waal looks expensive. Made of polished precast sections, its bladelike deck and the fluid curves of its piers do stand out. Mathieu Schouten, a landscape architect with the town of Nijmegen, who has worked on the project for 10 years, tells me they are now seeking to quantify that “spatial

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OVERDIEPSE POLDER



A terp is built up in layers



DEPOLDERING N

Typo: Noordwaard



quality is not expensive,” at least not in the long run. It’s telling that, despite the fact that the whole Room for the River project is based in long-term thinking, the appearance that money has been spent on good design for the public good is still troublesome. Mistaking cheapness for value is one of the most corrosive problems of our time, and it costs us in so many ways. The expensive-looking Waal bridge is built, though, so we can hope Schouten makes the case for it, and the bridge can serve as an exemplar of good value.

Terpen at the Overdiepse Polder

It is much simpler to protect a single point from flooding than it is an extensive area. This is a topographic truth that was known to the forebears of the Dutch, who would build a farmhouse on a

mound called a *terpen* of soil and augmented with household waste accumulated over time. *Terpen* were built in areas vulnerable to both sea and river flooding from the late Iron Age until the early Middle Ages, from the valleys of the Rhine and Meuse, in particular through Friesland into Denmark, and as far afield as Yorkshire and Lincolnshire in England, where they were called *thorps*.

When 17 farmers in the low, flood-vulnerable areas in Overdiepse Polder on the Bergse Maas River near Waspik were told by the government that they were going to have to give up their farms to control flooding upstream, they joined forces, but not to mount a resistance. Rather, they proposed an alternative. They met under a chestnut tree to decide their fate. All were well aware that they occupied vulnerable

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Extensive dike construction has a massive impact

land and that their farms were too small to modernize. The government was offering compensation and assistance with relocation, which eased the decision. About a third at that time wanted to stay, while the rest either wanted to leave or were undecided. And their proposal was to revive the terp. They would consolidate their farms, surrender their grazing land to periodic farming, and move the remaining farmsteads to artificial mounds, just as farmers would have lived 2,000 years before. The cabinet minister from the region cycled out along the dike to meet with the farmers and clinched the deal for them, including their lands in the Room for the River project.

Hans Brouwer and Johan de Boer, both representatives of Room for the River, took me to

meet Nol Hooijmaijers at his state-of-the-art dairy farm on the Overdiepse Polder. A crisp, modern farmhouse and an imposing but not overwhelming milking shed are perched there atop a rise. It is not a rustic, rounded mound, but a rectilinear podium built of postindustrial soil reclaimed by incineration. This is used for the core, and the terp is capped with clay for planting and to prevent the infiltration of water. Hooijmaijers shows us proudly around the cattle shed, with its automated milking system that carefully sanitizes between every milking, in which a laser guide locates the cow's teat. Here the Iron Age meets the Space Age. But one thing remains constant: that negotiation is never easy. Hooijmaijers tells us that, despite the inspiring story, there are still simmering resentments caused by the redistribution of

NOO **Typo: Noordward**



New pumping stations are built with reclaimed brick below the floodline a symbol that the old farms are submerged



One of the many new bridges with its bronze 'bird stick'.



The tension between land and water is everywhere apparent at Noordwaard

land, as anyone who has ever had a dispute over property lines will know.

Depoldering Noordwaard/Biesbosch

Noordwaard is the project the farthest downstream that I will visit. There are other projects farther out in the estuary, but they are more traditional dike reinforcements. Noordwaard, like the Overdiepse Polder, is notable because it represents a retreat from the floodwaters. De Boer stops the car at Fort Steurgat, part of the Hollandic Water Line defenses, which were designed from the early 17th century to transform Holland into an island in case of attack. From below the fort, it is possible to see barges passing by in the channel of the Nieuwe Merwede, coming to and from the Hollands Diep and the Haringvliet. It is startling, even unsettling, in Holland, to have a view of the water from behind the dike. Here, the dike has been lowered to allow the whole 17-square-mile area of agricultural land to flood with periodic regularity. Part of the dike is afforested with numerous willow whips (a stand of willows is called a *griend* in Dutch), which will absorb wave energy, allowing the dike to be lower. This is called a “wave-breaking dike.” It will be exposed to high water in a 100-year flood.

The Noordwaard borders on the Biesbosch National Park. Here, as at the Overdiepse Polder, an extensive and difficult process of relocating farms and houses was undertaken. In the initial mapping, dwellings were color-coded for flood risk, and then the most vulnerable dwellings were purchased by the government at the land price prior to depoldering—the additional vulnerability inevitably lowers prices and raises or obviates insurance. The largest cost at Noordwaard was for infrastructure, and the second largest was for land, properties, and relocation. In the case of the Noordwaard there was considerable opposition to the project, but over time it became clear to the constituency that their low-lying land would have to be surrendered and could not be protected in perpetuity.

Debates are now under way about whether to add the Noordwaard to the Biesbosch National Park, and if so, how much of it. As one drives into the Biesbosch from the Noordwaard, the landscape becomes progressively more wild and picturesque, quite a relief to the eye in such a gridded and ordered landscape. Here West 8 has had a hand in the designs, with a series of 36 shallow-arched bridges, each equipped with a

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Steps serve as a register
of the depth of floodwater

bronze “bird stick” to provide avian perches. West 8 has also designed a series of pumping stations, built of bricks reclaimed from the farmhouses demolished for the project. There is a bittersweet quality to seeing the traces of paint and wear on these structures, though this is offset by the fact that some are equipped as viewpoints, and the view out across the wetlands filled with bird life gratifyingly justifies the human upheaval.

While having coffee in the new Biesbosch Museum, a gleeful and slightly hobbit group of turf-roofed pyramids by Studio Marco Vermeulen that tells the area’s story, Brouwer and de Boer reflect on some of the lessons learned from the project. The scale of the project has been important—it helps to present a big picture to people so that they understand their landscape. Even the Dutch, with a wall of water pushing in from all sides, can be in denial or simply ignorant of their precarity. With scale comes increased spatial quality: “We need bigger examples, because the bigger the project, the better the payoff in quality,” Brouwer says. Perhaps most important has been cooperation at all levels and not just a willingness, but a need, to learn from the past, so amply illustrated by the terpen at Overdiepse. Finally, a certain wariness of the past is important. “We need to know the possibilities from the past,” Brouwer says, “but because times change, we also need to try again what in the past were failures.” Because individual techniques fit within larger strategies, as the overall context shifts, previously unviable methods can once again become relevant. One should never say, “We’ve tried that before, but it didn’t work.” ●

For more information, the Room for the River website has extensive information and many plans and photographs: www.ruimtevoorderivier.nl/english.

TIM WATERMAN TEACHES AT THE UNIVERSITY OF GREENWICH AND AT THE BARTLETT, BOTH IN LONDON. HE IS THE AUTHOR OF TWO TEXTBOOKS ON LANDSCAPE ARCHITECTURE, AND HE TRAVELS AND SPEAKS WIDELY.

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