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‘Water comes from all four sides’: how Rotterdam’s tidal park protects the city

Once a grim industrial harbour, the Keilehaven estuary acts as a natural flood barrier and wildlife sanctuary

by [Senay Boztas](#) in Rotterdam

It was once an industrial harbour, but now this small space is an entirely new kind of thing; a tidal park built to allow the river to rise and fall in the middle of the city as wildlife thrives. The swans are already at home on the sparkling waters of the Keilehaven in Rotterdam, in the [Netherlands](#), and other birds are quickly settling in; grebe, oystercatchers, wild ducks and kingfishers.

This, believes landscape architect Dirk van Peijpe, of architecture bureau [De Urbanisten](#), may be a shape of things to come. “We are increasingly working on an ecological agenda that is not only climate-sensitive but also [nature-sensitive](#). What are we doing for city residents other than the human ones?”

The [award-winning](#) tidal park, a stone’s throw from his shared offices, is one answer to that question. Once it was a typically grim industrial harbour. Now a beach of sand leads to the water, surrounded by shelves of varying heights and barriers made with [tiles](#) Rotterdammers have removed from their gardens, where indigenous plants will be seeded and left to do their thing.



An image showing the concept of a river as a tidal nature park. Photograph: Urbanisten

“New species are emerging due to the arrival of the nature-friendly banks, like wading birds that come to forage in the silt,” De Urbanisten’s senior landscape architect Marit Janse said. “Building tidal parks is also about the lost identity of this region as a natural estuary system ... looking for the balance between natural processes and the cultural intervention that is a park.”

This work is not a luxury. Rotterdam is a city which, like most people or places in the Netherlands, identifies itself in relation to water. It’s a historical relationship; the saying goes that God created the world but the Dutch created the Netherlands, and 1930s poet Hendrik Marsman described a land where “the sound of the water/ with its eternal disasters/ is feared and heard”.

But it’s also a present and future relationship, as sea levels rise and the climate crisis is linked with [more severe bouts of rainfall](#). “In Rotterdam, the water comes from all four sides,” said Van Peijpe. “Delta cities are vulnerable to climate change, especially to sea level rises, which are [happening faster than expected](#), but also to what comes from the rivers. There is an increase in heavy rainfall – alongside drought – and also rising groundwater, often in combination with subsidence.”

Aerial footage shows flooding across Belgium, Germany and the Netherlands – video
In December, Storm Pia and extreme precipitation hit: Rotterdam closed its Maeslant storm barrier for the first time to protect against storm surge while other areas [piled up sandbags](#) against [unusually](#) high water in the Maas and Rijn rivers and the IJssel and Marker lakes. It is now explicit government policy that not just water management but also urban development is “[led by water and ground](#)”, says floods senior specialist Dr Frans Klijn, from the [Deltares](#) institute. “The weather is getting rougher,” he said. “We have been able to keep

the water levels and also the groundwater levels within very tight ranges, but we now foresee that that will be impossible in future. So our water boards already say to new developers: we need more space for water storage and we need more flexibility for water level variations, more fluctuation potential, larger freeboard, so stay out of the wet areas. And we need more room for storage and discharge.”



Weaving a fascine mattress of willow branches. Photograph: M.Janse/Urbanisten

A €2.3bn “Room for the River” project – making floodplains at more than 30 locations on four rivers – is credited with saving the country from the worst flooding this year. The national delta programme is investing in action to guard until 2050, and a multi-billion euro flood protection programme (HWPB) involves 100 projects to strengthen kilometres of dykes, without which, says Rijkswaterstaat infrastructure organisation, 60% of the country would regularly be under water.

But in cities, too, water protection must meet urban design to create an attractive, adaptive city, says Arnoud Molenaar, Rotterdam’s chief resilience officer. A vast amount of work has been going on, and the city has built water squares, green and blue roofs and a 2km-long railway viaduct rooftop park. The water squares, also designed by De Urbanisten, are, very simply, built in overflow areas – when there is too much rainwater they fill up, and then slowly drain away so that the storm drains are not overwhelmed. And when the water has gone, they become public spaces again.

“The most important thing is that we are not investing in regret measures,” says Molenaar. “We are talking about transformative delta management, not adjusting things here and there. We have to talk about water safety in the context of all of the other transitions. But also, houses that are part of a waterfront have a higher value, we want a greener city, to become attractive for higher-income families, for companies. And by working in a smart way on an adaptive city, we can also increase attractiveness.”



An artist's impression of low tide at the development. Photograph: Urbanisten

It's an opportunity for nature too, says Niels de Zwarte, deputy director of the Natural History Museum Rotterdam: mussels and algae, fish and macrofauna could shelter under floating houses, while green facades foster plant life. "We will have to create and design catchment areas for water in our special planning," he agreed. "These are also the places where part-nature, part-recreation can have a place and where city dwellers can enjoy themselves."

Friso de Zeeuw, TU Delft emeritus professor in spatial development, says the only danger with too much of this kind of urban planning is a loss of realism in a country that used to experience floods every year. He advocates strengthening dykes and giving rivers room but says accepting occasional minor flood damage is better than a [dictatorship](#) of new planning rules. "We have become a bit like the princess and the pea, in that if we get a little wet we start screaming blue murder," he said.

But many welcome a change in the tide of urban design – certainly at Keilehaven. "I am in love with nature projects that allow tidal effects," added de Zwarte. "Almost nowhere in the world will you find a city with this tide in the river where you go from fresh to salt. That is what makes Rotterdam unique."