Research paper

Life Beyond The Dike: Exploring the Potential of Water to Revitalize Heritage in the Waterdriehoek

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Abstract
The Dutch Delta region has a rich history deeply intertwined with water, which has shaped its cultural identity. However, a growing separation between heritage preservation and watermanagement, coupled with the challenges of climate change and rapid urbanization, presents a critical problem. It not only threatens the relationship between people and water but also affects the preservation of both watermanagement and maritime heritage, weakening regional identity. In addition, this separation also causes heritage to be left out of discussions about delta planning, hindering the exploration of water's potential to link watermanagement and maritime heritage sites and connect the past to the present. This problem raises a fundamental question:

'How can adaptation, preservation, and reuse of the uiterwaarden reactivate and strengthen the relationship between people and the water of the Dutch Delta?'

The key to addressing this question lies in understanding the historical and cultural significance of water to the inhabitants of the Dutch delta, and how it has shaped the uiterwaarden. The uiterwaarden in urbanized areas acts at present as a physical barrier between people and water due to their assigned industrial and watermanagement functions. However, in the face of a changing industrial landscape, the connection these sites have to water and to history might also give them the potential to connect people to water again. Thus, strengthening regional identity and preserving both watermanagement- and maritime heritage.

Keywords **Water | Maritime Heritage | Urban landscape | Delta Planning | Adaptive Strategy**

Introduction

Today, the complex and diverse systems of the past are necessarily the framework for preservation and reuse as well as for new systems (Hein, 2020). But at present, heritage and water are largely two separate disciplinary and professional fields (Hein, 2020). Water is examined through a scientific, engineering, and governance lens, while heritage is often looked at as individual structures rather than parts of a larger system. Both are mostly top-down approaches. This separation has led to a lack of exploration of water's potential to connect heritage sites, link the past with the present, and influence spatial developments. That is why understanding the link between water and heritage is crucial for designing new relationships with water. Adapting old systems can contribute to the quality of life, sense of place, and identity.

Understanding the relationship between water and heritage can also help us refine our understanding of tangible and intangible heritage more broadly (Hein, 2020). This disconnection is evident in the Dutch delta, where Water-related policymaking is fragmented, and rich water management heritage is often overlooked in discussions about the delta's future.

Unraveling
To better understand the region, the difference between 'Watermanagement Heritage' and 'Maritime Heritage' has to be made clear. Firstly, watermanagement heritage is embodied by the management of the watersystem, defense against flooding, and the utilization of water as a resource. Including iconic elements like dikes, polder landscapes with mills, and the Biesbosch as a unique tidal landscape that provides drinking water. Secondly, maritime heritage relates to access to the sea and the reliance on water for sustaining the livelihood of communities. Tangible and intangible aspects of industries such as dredging and shipbuilding and their logistics in and along the river to the sea. (Hein, personal communication, 2024)

In the Dutch Delta, a unique combination of both themes has formed and influenced the region. While looking inwards to provide and protect, the Dutch delta also looks outwards as the birthplace of industries working on a global scale. This seemingly fictional character of both narratives blends into a unique delta identity. Changing water levels causes strategies to defend against water to evolve. This raises important ethical questions that affect the whole region: Do we start letting the water in again or do we reserve more space for dikes? What does that mean for remnants of the past? How do we tell both parts of the narrative? How does that translate into new spaces for people to interact with water?

Understanding the link between water and heritage and how it forms a regional identity is crucial. This research attempts to link three, presumably related, themes. The relation people have with water, how it is influenced by watermanagement- and maritime heritage and how these themes influence regional identity. *Figure 1.* The relation of inhabitants of the Dutch Delta with water strengthens their sense of place and self-identification and vice versa. Contributing to the Delta Identity is also the regional watermanagement- and maritime heritage and its built remnants. Tangible heritage such as shipyards, waterfront factories, warehouses, dikes, and mills have been there as the physical space that connects people to the water. But also the intangible heritage such as daily practices, rituals, and narratives around water sustain people's relation with water. Presumably, the connection people have with water and how they identify with the heritage of the region are interrelated. Therefore exploring the places that facilitate interactions with water, the riverfronts, and what part they play in the region's cultural heritage is worthwhile.

I hypothesize that the 'triangle' is a mutually sustaining relationship between the three different themes. With this in mind, there is reason to believe that change in one of the three themes influences the other two. For this area, the floodplain, which will be introduced further in the next chapter, has been chosen. The main reason is that both watermanagement and maritime industries influence its territory. The connection or disconnection to the sea is dependent on what we value, consequently heavily influencing how these floodplains will be used, and what heritage will be preserved. Part of the hypothesis is that solutions are to be found in these areas because of their proximity to the water. Enabling a hybrid between architecture, landscape, and infrastructure, blurring the lines between water and land.

This research aims to provide insights into how the relationship between people and water has changed and can be reactivated and strengthened. Consequently also have a positive effect on the preservation of the regional identity of the delta and its heritage. Ultimately, with the overarching goal of making citizens and policymakers of the Dutch delta more aware of the importance of heritage sites and the relationship they had, have, and will have with water for a sustainable future.

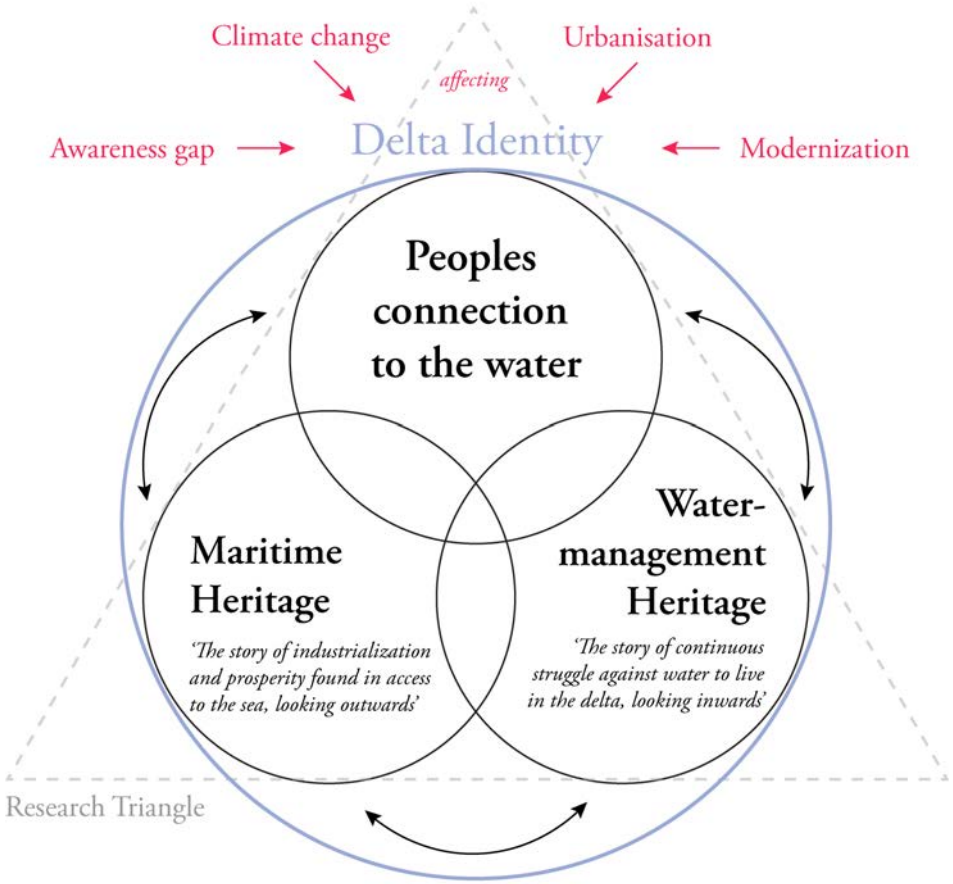


Fig. 1 Research triangle and relation between different themes

The Uiterwaarden and Heritage sites of the Waterdriehoek

Deltas are the most vulnerable places in the world (Willems & Van Schaik, 2015). More than half of the world's population lives in deltas because of their ability to provide fresh water, food, and trade. Although, deltas are also the first areas impacted by climate change. As climate change is accelerating, the Dutch delta is one of those areas impacted. The rising sea level is affecting the lower rivers, and their capacity is also under pressure from increasing rainfall in the Alps (Steenhuis, 2018). Coupled with the rising number of heavy downpours and growing urbanization, the ability to adapt is of growing importance. (Appendix A)

The floodplain is generally considered to be the relatively flat area of land that stretches from the banks of the parent stream to the base of the valley walls and over which water from the parent stream flows at times of high discharge (Goudie, 2004). In the context of the Dutch Delta, these banks reach from the parent stream to the base of the winter dike. Therefore the areas outside of the dike are referred to as 'uiterwaarden', the Dutch definition. *Figure 2.* The uiterwaarden in The Netherlands, especially in the Waterdriehoek, is often used for maritime activities, essentially losing its natural floodplain system. *Figure 3.* Watermanagement and the maritime industry have a different relationship with water. One looks inwards whilst the other one looks outwards. During the modernization of the Dutch delta, rivers have been thoroughly engineered to provide particular services and functions, but as an unintended consequence, they have been engineered out of our daily perception and experience (Prominski et al., 2017). Resulting in the uiterwaarden being disconnected from the urban fabric, mentally because of their assigned function and physically by the primary water defense line, the dike. Ultimately disconnecting people inside of the polder from the water and riverfronts.

It was only when the water became dangerously high in 1995 that new watermanagement strategies emerged. The 'Room for the River' program was established in 2007 as a starting point for the adaptation of the uiterwaarden. More room for rivers also means a change in the land use around rivers. It not only delivers greater water safety but also new natural and recreational areas (Ministerie van Infrastructuur en Waterstaat, 2023). While this is a solution for the meadows in less urbanized areas, urbanized areas such as the Waterdriehoek are harder to adapt. *Figure 4.* Firstly, because of the existing buildings inside the polders. Secondly, the maritime industry established in the uiterwaarden holds significant value. The historical industrial developments played an important role in the formulation of regional and local identities (Nevzgodin, 2016). It becomes apparent that not every region along the Dutch Delta can follow the same top-down approach in either water or heritage management and expect the same results.

The topographical map of the Waterdriehoek shows land use along the Noord and Merwede rivers in greater detail. Along the waterfront between Ridderkerk and Zwijndrecht, areas with different functions alternate. A mix of Industrial (Both maritime and general) and Natural (Grienden and floodplains) areas alike, with their qualities and interaction with the river. On top of that, there are also plans to expand residential areas along the riverfront of the Noord. The same applies in the Dordrecht region. As one of the earliest settlements, The historical center of Dordrecht was built before the primary water defense system. Therefore the connection between the city and the river is more evident than for example in Papendrecht or Sliedrecht. The Wantij canal disconnects 'De Staart' from the city. From a historical perspective, it seems that the disappearance of the characteristic wood mills in this area, one of the largest industries of that time, made room for other types of industries. Whereas some of them can be classified as maritime, most of them are

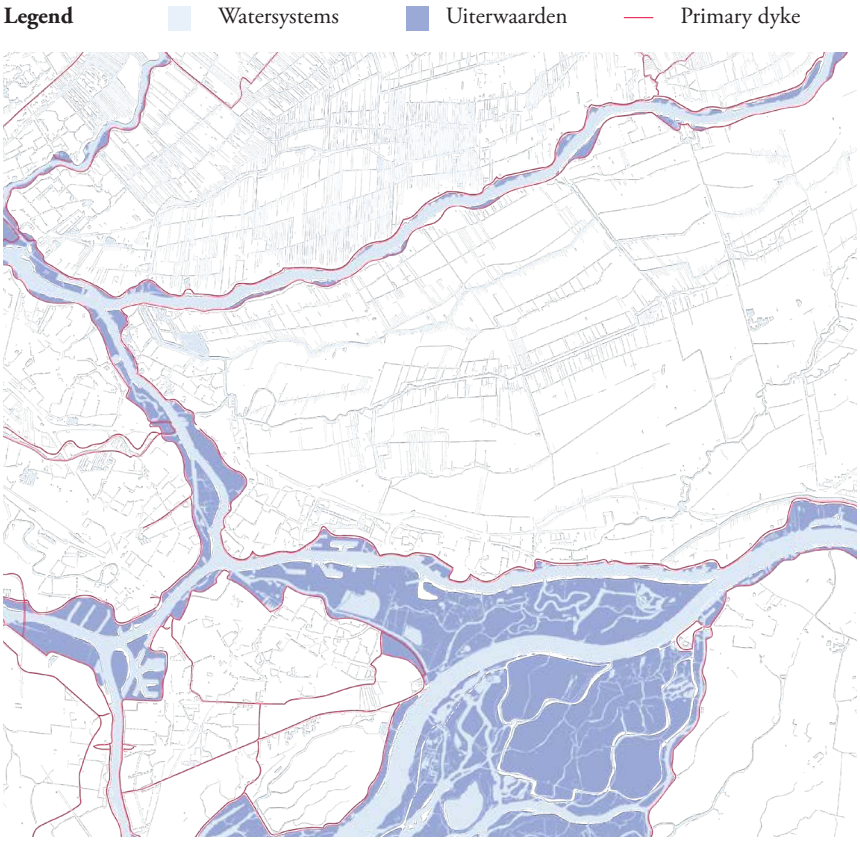


Fig. 2 Uiterwaarden in the Waterdriehoek PDOK & Rijkswaterstaat. *(2018)*

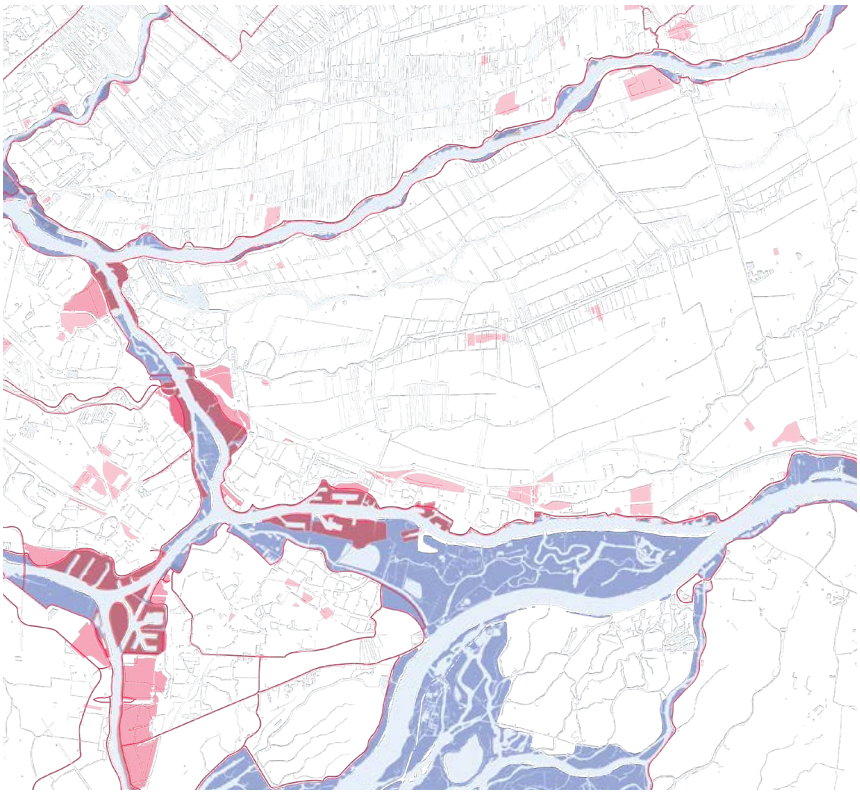


Fig. 3 Industrial sites in the Waterdriehoek Provincie Zuid-Holland *(2021)*

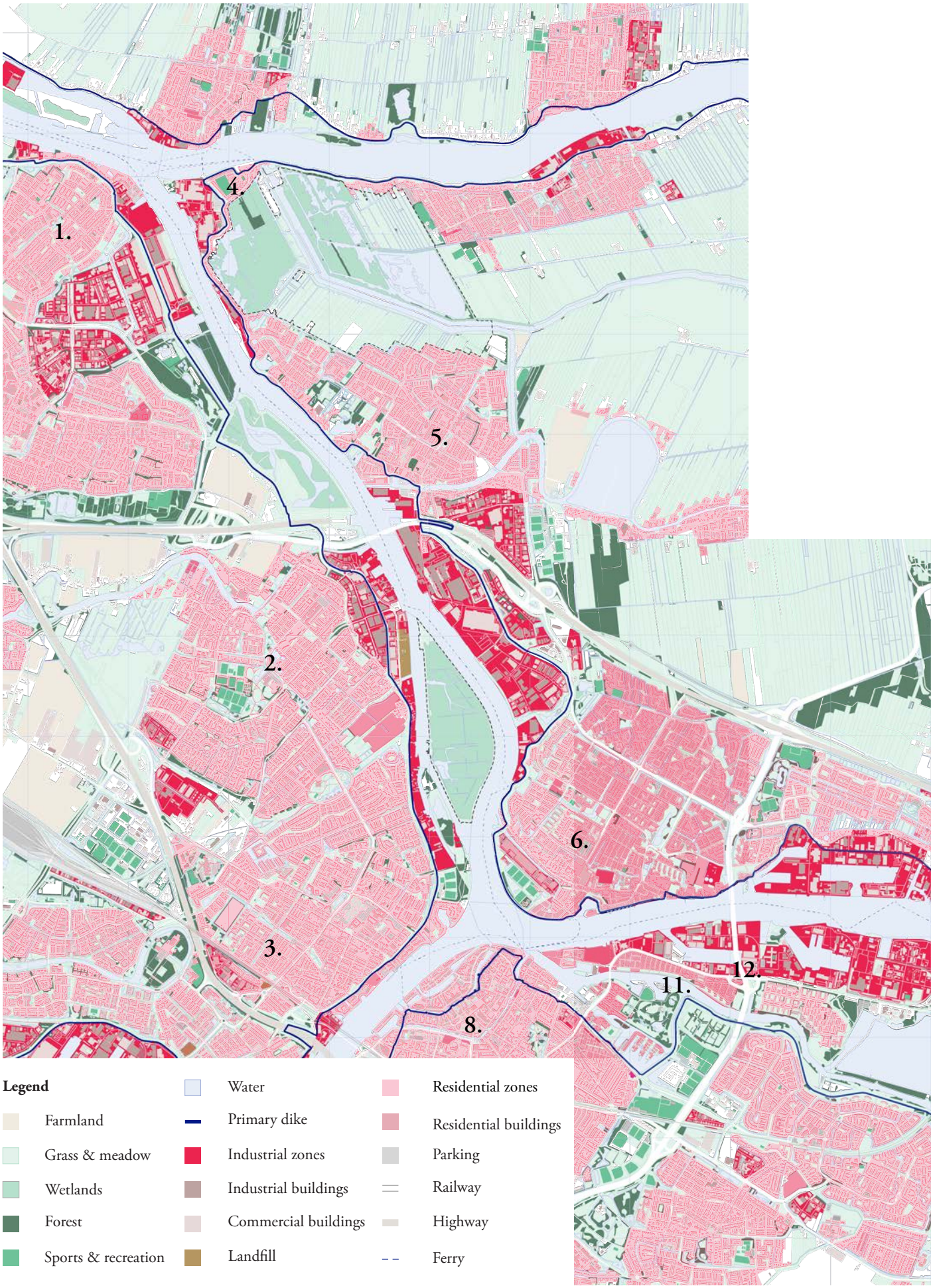
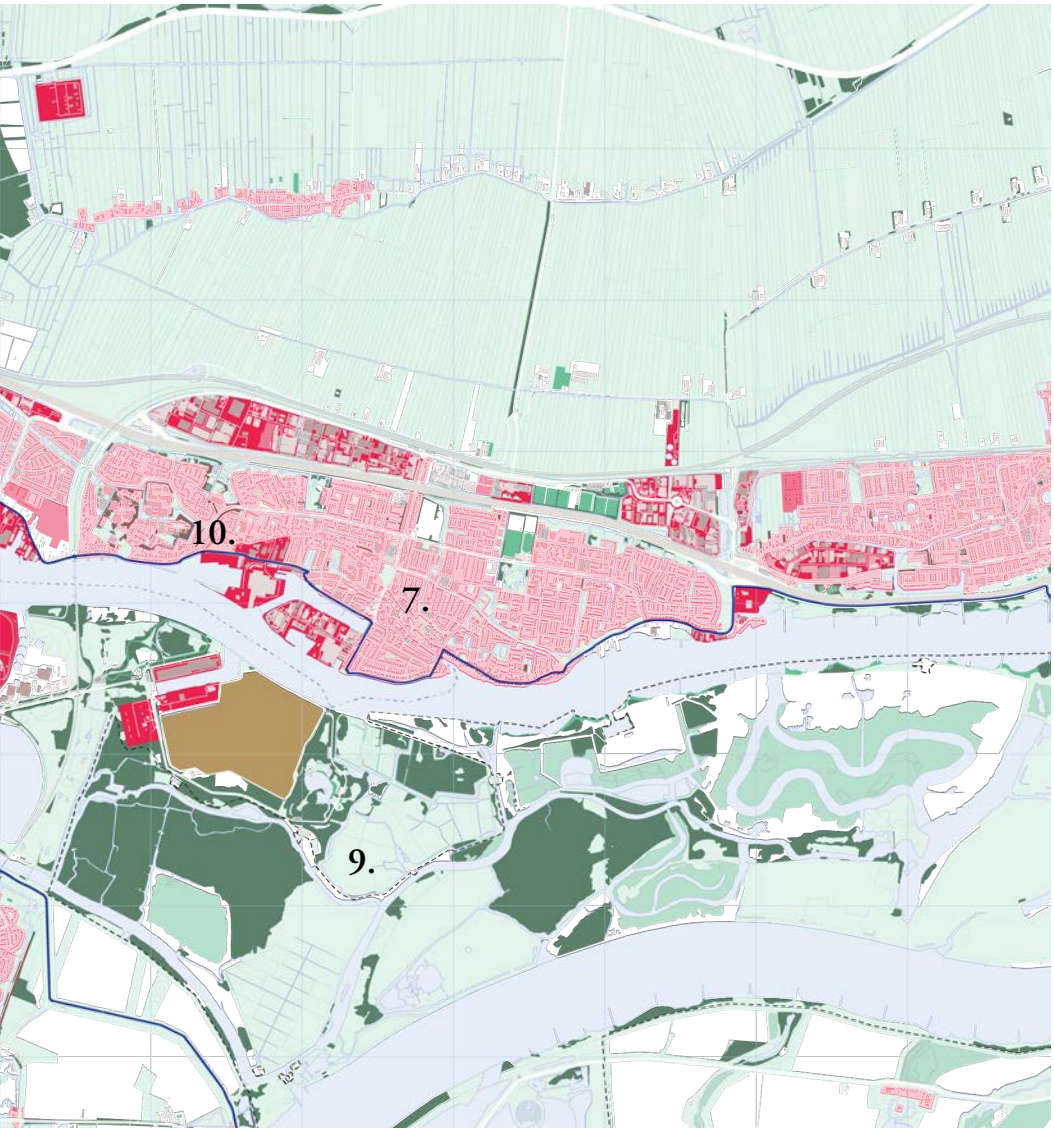


Fig. 4 Waterdriehoek topography Openstreetmap *(2023)*

not inherently from this region. ‘De Staart‘ also contains residential areas, which are currently expanding. ‘De Staart’ gradually becomes the most northern part of the Biesbosch, with multiple large recreational areas along the waterfront.

On the contrary, the Alblasserwaard (4-7) has little to no uiterwaarden, let alone variation. The areas outside of the dike are used for mostly maritime industries, inaccessible to the public. While quality interactions with the waterfront are now very limited, there is potential to reconnect the residents of the Alblasserwaard to the water again. Reintroducing nature-based functions such as floodplains and grienden, but also residential areas and public waterfronts can help fulfill this potential. Suggestions for redeveloping the Alblasserwaard riverfront can be derived from the opposing sides of the Merwede and the Noord. Ultimately binding together the area as a whole in one cohesive network.

However, the redevelopment of the riverfront of the Alblasserwaard into a cohesive network asks for a common theme. Such a guideline could help to identify where and to what extend the waterfronts can be improved. A clear and recognizable theme would be to look at heritage heritage sites along the river as potential redevelopements. Reconnecting people to the water, while simultaneously giving new life to these heritage sites. Furthermore, in times of change and uncertainty, looking at heritage also helps to get a better understanding of place and historical continuity. (Willems & Van Schaik, 2015). Due to the density of early civilizations in delta



Areas

1. Ridderkerk
2. Hendrik-Ido-Ambacht
3. Zwijndrecht
4. Kinderdijk
5. Alblasserdam
6. Papendrecht
7. Sliedrecht
8. Dordrecht
9. Biesbosch
10. Baggermuseum
11. Wantij (canal)
12. ‘De Staart’

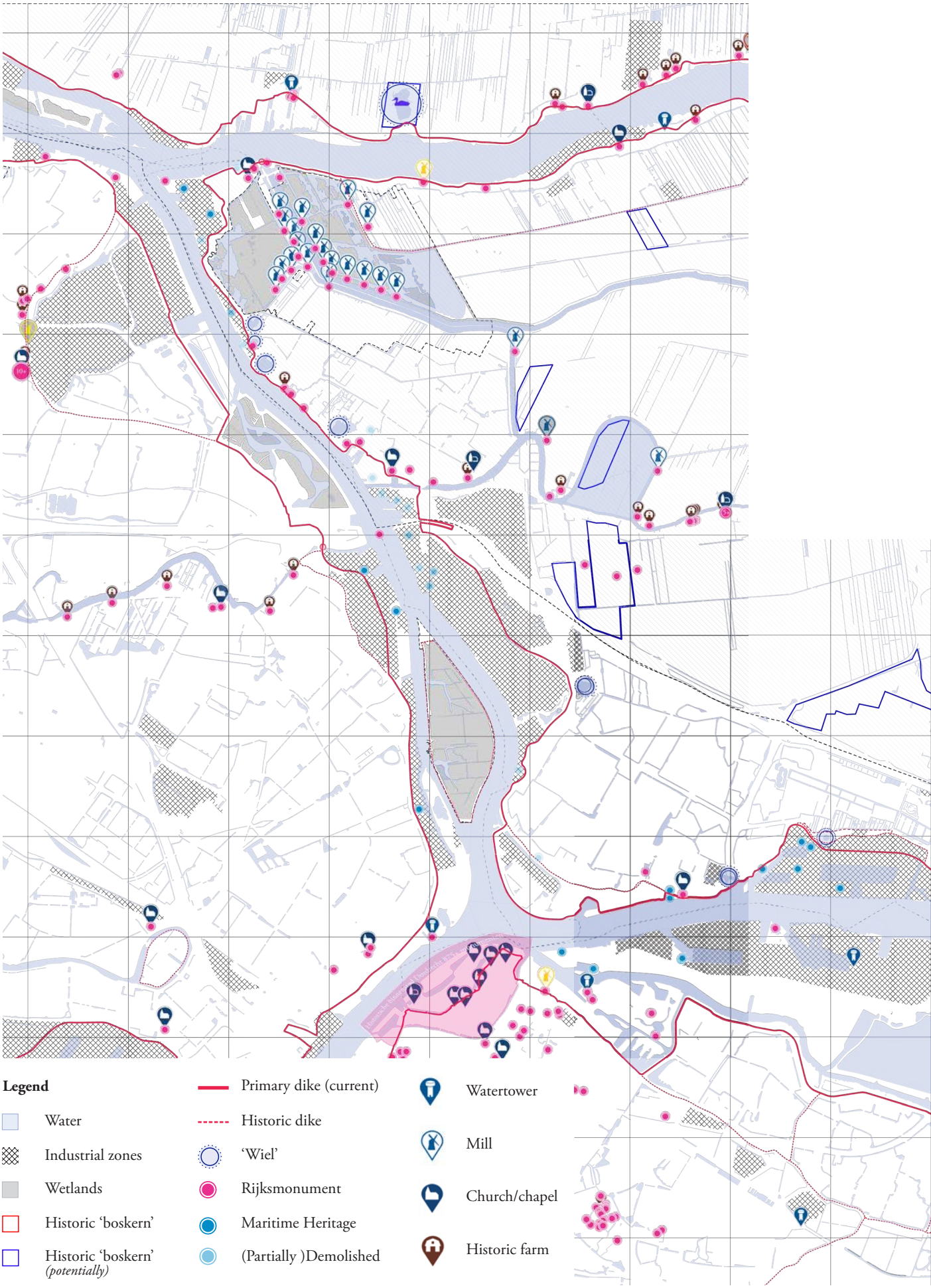
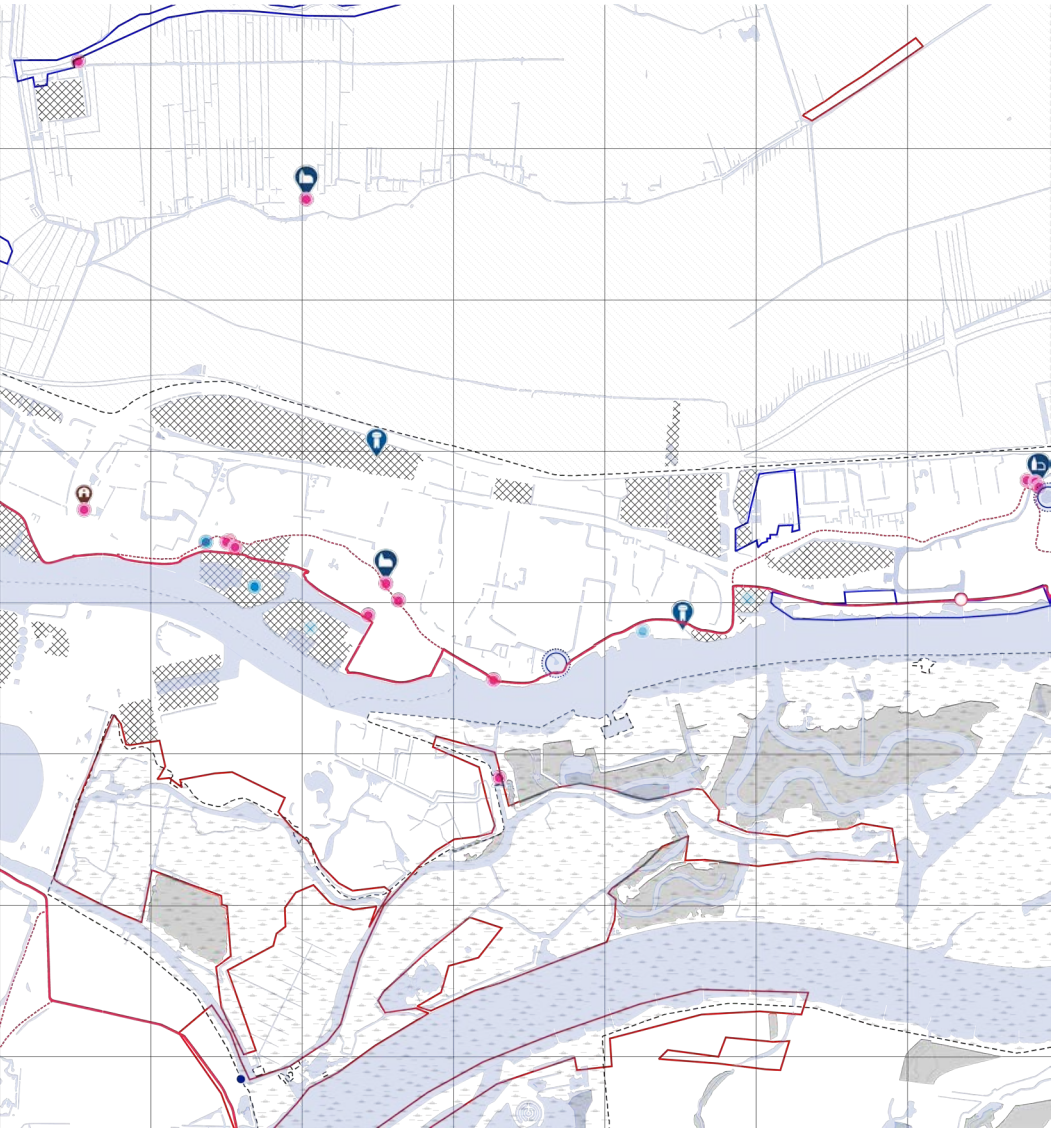


Fig. 5 Waterdriehoek Erfgoed Rijksdienst voor Cultureel Erfgoed *(2023)*

areas, the Waterdriehoek has a high density of heritage sites. The riverfronts of the Waterdriehoek are the birthplace of maritime industries such as shipbuilding and dredging, therefore the livelihood of the population in those areas was tightly connected to the industries. Furthermore, watermanagement heritage in the waterdriehoek is rich, historically layered and strongly tied to cultural identity (Hein, 2020). Together they form a strong regional identity, this identity is also a substantial part of Dutch national history and culture. Although, in the last decennia the heritage of the Waterdriehoek is under pressure. A lack of funding and public interest among other complex causes has led to the total or partial abandonment of cultural heritage. For Example, the Baggermuseum is on the brink of being transferred to Rotterdam, losing the connection to its birthplace in the Alblasserwaard.

The rapid urbanization of delta areas without respecting water-related heritage accumulated over the centuries makes these areas, in which economic, social, and cultural values are concentrated, vulnerable (Willems & Van Schaik, 2015). On top of that, riverbanks are losing their port functions due to the modernization of the maritime industry (Den Boer, 2019). Small-scale shipyards, factories, and warehouses are being overshadowed by new industrial halls. However, it often is these smaller-scale buildings and objects that are evidence of the region's rich maritime history. An increasing number of these identity-defining historical buildings, such as old shipyards and factories, around the rivers the Noord and the Merwede are disappearing (Kramer et al., 2009). Figure 5. Additionally, watermanagement is no longer a public responsibility like it was



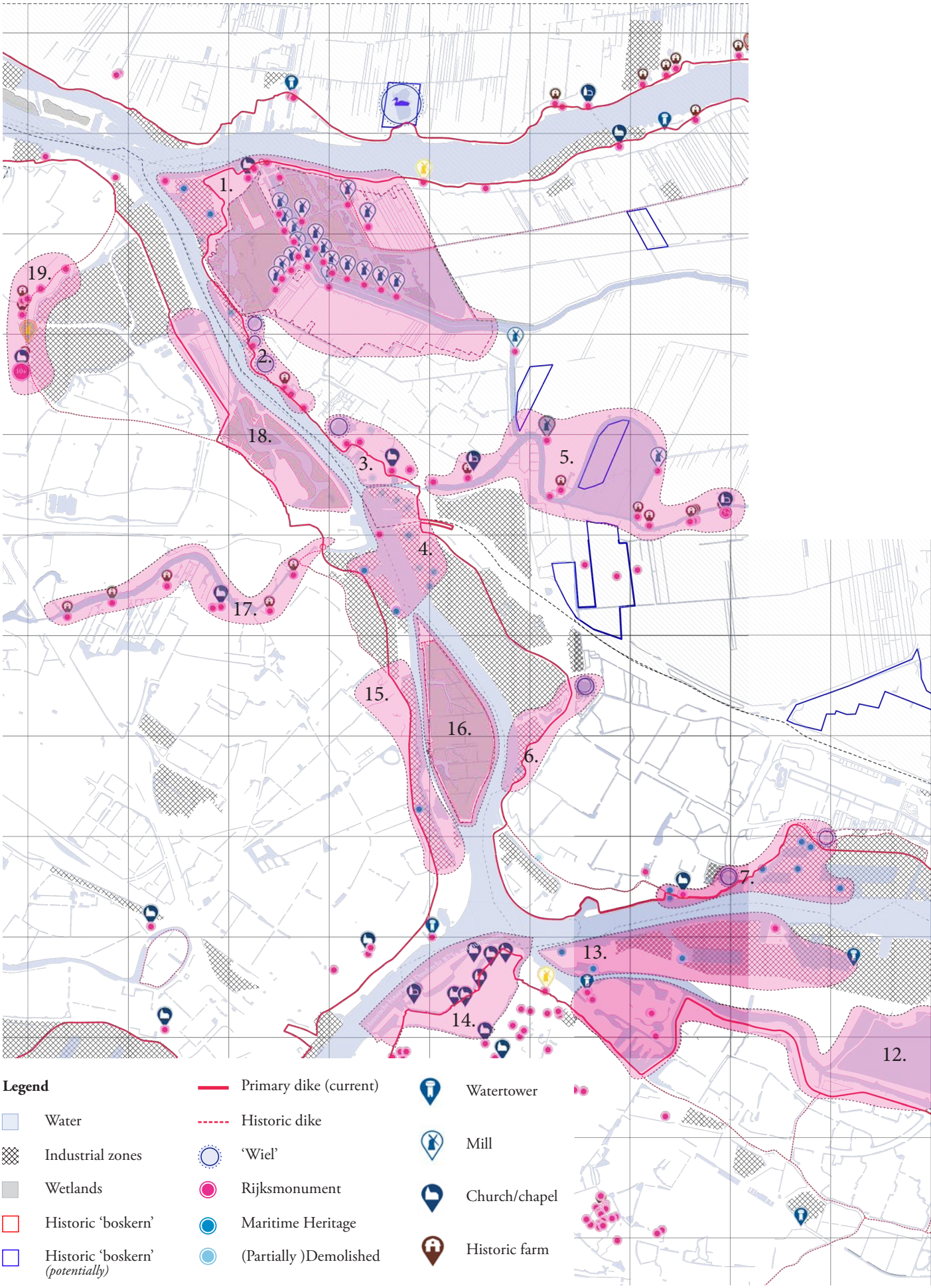
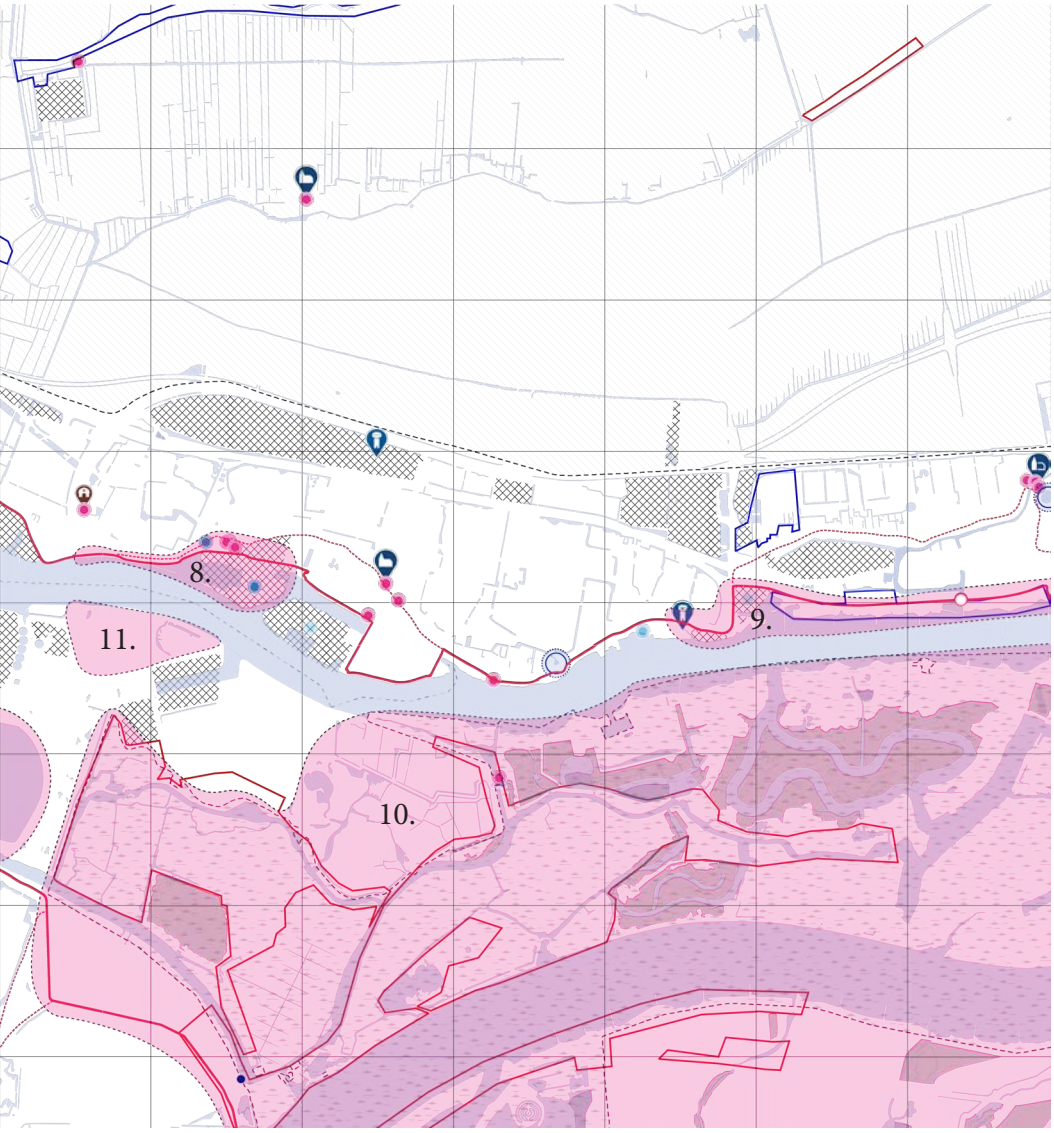


Fig. 6 Areas of interest in the Waterdriehoek Rijksdienst voor Cultureel Erfgoed *(2023)*

in the past. At present, Dutch citizens often take water security for granted, resulting in reduced engagement in water-related discussions (OECD, 2014). On top of that, heritage is currently rarely discussed in delta planning (Hein, 2020), widening the gap between water and heritage.

When mapping out historical sites such as monuments, churches, mills, farms, and shipyards a pattern seems to emerge. *Figure 5.* Seemingly all of these historical sites are either situated along the water or dike. Once again this confirms that the watersystem and heritage of the region are interrelated. This also strenghtens the idea to use heritage sites as a common theme to redevelop the Alblasserwaard riverfront. Another remarkable finding is that 'wielen' only exist on the Alblasserwaard side of the two rivers. 'Wielen' are formed when a dike breaches, these were the weakest spots. The immense force of the river creates a whirlpool that leaves behind a circular pond. The dike is built around, but these 'scars' in the landscape can be recognized for ages (Janssen, 2009). Reinterpreting this evidence of the struggle against water found in the landscape of the Alblasserwaard, and reusing these places to facilitate interactions between people and water again. This is an example of the many ways heritage can be used to reconnect people to water, while also telling the stories of the past, a key part of this strategy.

Kinderdijk UNESCO world heritage site, the historical center of Dordrecht, and the Biesbosch are well-known areas by the Dutch population and tourists alike. On the contrary, the Crezéepolder, Sophiapolder, Ketelhaven, The Baggermuseum, and many more areas are often



Potential areas of the Heritage Network

1. Werelderfgoed Kinderdijk
2. Factory Kloos
3. Historic Alblasserdam
4. Maritime heritage 'De Noord'
5. The Alblas
6. Noordhoekwiel
7. Ketelhaven
8. Baggermuseum
9. Riverbed/beach Giessendam
10. Biesbosch
11. Crayensteijn
12. Wantij Park
13. 'De staart'
14. Historic Dordrecht
15. Living at 'De Noord'
16. Natuureiland Sophiapolder
17. Oostendam
18. Crezéepolder and the Griend
19. Historic dike Ridderkerk

overlooked. Regrettably, the stories these places tell are more likely to be forgotten, deteriorating their heritage value as time progresses. As a first exploration, the Waterdriehoek region is divided into 19 areas with different functions, qualities, history, and relation to the river. The Blue Papers journal suggests a set of icons to categorize tangible and intangible objects and practices related to water (Hein et al., 2022). *Figure 7.* The icons help identify different functions related to water and heritage. Ideally, the areas marked in *figure 6* host one or more of these functions. Some of these categories appear more present in this study than others. Tangible subjects include drinking, irrigation & agriculture, drainage and sewage, shelter and defense, energy & industry, transport and places of leisure. Intangible subjects include Recreation, laws & policy, institutions, education, and preservation/adaptation/reuse.

Fig. 7 Icons of the Blue Papers journal present in the Waterdriehoek

These functions are in some areas already recognized (1, 3, 5, 10, 11, 12, 14, 16, 17, 18, 19) and made available for the public, in other areas (2, 4, 6, 7, 8, 9, 13, 15) the waterfront is completely cut off from the public by industry or infrastructure. Reintroducing these areas to the public as part of a larger network as a means of preserving the heritage of the Waterdriehoek is worth exploring. Situated mostly in the uiterwaarden the network connects heritage sites literally and figuratively through water. The connection between heritage sites and water also acts as a starting point for reconnecting people to water again.

Introducing an Adaptive Strategy

Climate change and continuous urbanization of the Waterdriehoek will inevitably impact the way people interact with water. As a result, the design of waterfronts and their accessibility from the polder needs to be adapted for the future. Identifying the areas with high potential is the first step. The next step would be to link the areas together, to complete the story and preserve the region's diverse cultural heritage. The connecting factor is water, while it can be used to transport people between heritage sites, there are more ways to connect heritage sites. In an attempt to build up a network more figuratively, the uiterwaarden of the Waterdriehoek are investigated through a field research. The method identifies and analyses how urban and rural spaces interact with the water and the Dutch river landscape. By analyzing how these spaces fit in their context and how specific elements facilitate interactions with water, the inventory (Appendix B) delves into the identity of the Dutch Delta. The objective is to understand why some places and urban elements work well, and others do not. Bundling them so they can be reinterpreted for future design proposals in the uiterwaarden.

Given the changing dynamics of the Delta, the physical existence of these places/objects tends to evolve. This method makes an attempt at identifying tangible and intangible qualities as well as their ability to create a certain spirit of place. When reimagined or revitalized in new designs,

it is the qualities inherent in these elements that hold importance, rather than the place/objects themselves. The strategy proposes preserving their spirit of place. Re-imagining the riverfront inspired by the inventory reinforces the existing network and creates a resilient framework that adapts to the changing dynamics of the uiterwaarden. Using this framework in future urban developments around heritage sites in the Waterdriehoek improves people's interaction with the water. Ultimately, fostering renewed connections between cultural heritage and water and enhancing the region's environmental adaptability and heritage preservation efforts.

Conclusion

Cultural heritage is not objective, it's a deliberate selection of stories we deem important. In the case of the Waterdriehoek both 'maritime heritage' and 'watermanagement heritage' form the backbone of the region's cultural identity. Although the context of the urbanizing region is changing, it is not necessarily too late to adopt a strategy that plays into the history of the region, whilst also focussing on becoming a more future-proof delta, where people are once again reconnected with the water. The outer dike areas of the region have a high potential to be adapted and reused. The proposed strategy argues for a new method, preserving heritage by reconnecting people to the water again, much like they were in the past.

Viewing the history of the Waterdriehoek as stages with a unique cultural, economic, and societal context, explains how the uiterwaarden has been subject to constant change. These transitions, happening in the uiterwaarden, should be highlighted in the cultural heritage network. Recognizing their adaptability throughout history informs the need for an adaptive approach in planning delta regions. Emphasizing dynamic elements like wetlands is crucial in heritage policies, even in urbanized areas. Changing the approach to tell a more diverse and complete narrative of the Waterdriehoek, does not mean we have to forget/deny the importance of industrialization and urbanization. Instead, we should use the remnants of shipyards and factories that were so important to the vitality of this area, and critically frame them as a part of the heritage of the Waterdriehoek. Even if their function changes due to urbanization or climate change.

Looking on a regional scale there is potential for a well-integrated heritage network connected by water. However, some areas in the uiterwaarden desperately need new functions and renewed interactions with the water to be once again part of the network, and therefore also the narrative. These interactions ought to be informed by the inventory. Using the inventory as a framework in future urban developments to facilitate spaces that interact with water, revitalizes heritage sites in the Waterdriehoek. Ultimately, fostering renewed connections between cultural heritage, water, and people. The strategy is the first exploration into managing heritage whilst enhancing the region's environmental adaptability.

When zooming in and approaching the Baggermuseum area more locally, there are some key outcomes to take into account when redeveloping the area. Firstly, the flow of people from the polder to the waterfront. The inventory shows different transitions from 'behind the dike' to the uiterwaarden. Combining directional elements from 'towards the water' and 'along the water', makes it is possible to guide people through the area. Secondly, the implementation of a variety of 'places to stay' along the waterfront to facilitate different interactions with water. Thirdly, these spaces are equiped with 'elements' that improve functionality and but also elements that reinforce the maritime character of the area. And lastly, the introduction of the drilling heads of baggerships as 'landmarks' for wayfinding purposes, tying the area together as a heritage site.

Glossary of terms

Adaptability - knowledge or understanding about a specific issue, concept, or problem within a particular group or community.

Awareness - knowledge or understanding about a specific issue, concept, or problem within a particular group or community.

Climate change - a change in global or regional climate patterns, in particular a change apparent from the mid to late 20th century onwards.

Delta Identity- Combination of both water and maritime heritage and identities in the region of the Dutch delta.

Griend - A tidal area or a piece of land, often located in or near a river or estuary, covered with low, dense vegetation such as willows or other shrubs.

Holistic - characterized by the belief that the parts of something are interconnected and can be explained only by reference to the whole.

Intangible - something that exists but that cannot be touched, exactly described, or given an exact value.

Maritime Heritage - cultural, historical, and natural legacies that are passed down from previous generations to the present and are preserved for future generations, associated with activities on water.

Maritime Identity - characteristics, qualities, beliefs, values, and affiliations that define and distinguish an individual or a group of people associated with activities on water.

Meadow - a tract of moist low-lying usually level grassland

Modernization - the process of starting to use the most recent methods, ideas, equipment so that something becomes or seems more of the present time.

Narrative - a particular way of explaining or understanding events.

People's relationship with water - the various ways in which individuals and communities interact with and depend on water in their daily lives and in the broader context of society and the environment.

Resilience - the capacity to withstand or to recover quickly from difficulties/change.

Riverfront - the land or area along a river.

Spirit of place - visible and invisible distinctive aspects of a space that makes a place unique.

Tangible - something that can be touched or perceived through the senses, often referring to physical objects or assets.

The Dutch Delta - A region in the Netherlands where the Rhine splits into smaller rivers before reaching the ocean, known for its complex water management systems.

Urbanization - the population shift to urban areas, and the ways in which societies adapt to this change.

Values - the individual or collective principles and beliefs that motivate people to act one way or another or deem important.

Waterfront - land or a section of a town bordering on a body of water.

Water Heritage - cultural, historical, and natural legacies that are passed down from previous generations to the present and are preserved for future generations, associated with management of water.

Water Identity - characteristics, qualities, beliefs, values, and affiliations that define and distinguish an individual or a group of people associated with management of water.

Waterdriehoek - the area of the Biesbosch, the Drechtsteden, and the UNESCO world heritage site Kinderdijk. Water serves as the connecting element in this region.

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