## **Delta Interventions**

Graduation Studio

## **Towards an open delta...** Research and design for sustainable urban landscapes in an open Dutch Southwest Delta

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## Project description

The invention of technology for land reclamation in the 10th century started a unique transformation in the delta. Sand plates were dike-ed and pumped and became polders. Examples of early harbor cities created on the dike-ring are Ooltgensplaat and Oude Tonge. These cities were founded at the main creek of a sand plate. The polders created a condition for more sediment deposition, due to the hard edges of the dikes. Outside the dike-ring sediment cumulated and formed new sand plates. These sand plates formed the basis of a new adjacent polder and a new harbor settlement.

The latest polders date from 1930's, but technically the process came to an end in 1953 with a stop of sediment transportation in the delta. The Watersnoodramp in 1953 led to the engineering of a great and expensive water defense project that would protect the inhabitants of the Southwest Delta against probable storm surges. Shortening the Dutch coast line and closing the Dutch Southwest Delta.

However, the Delta Werken caused complications that were not predicted in time of planning and construction. The world known water defenses created environmental problems as blue algae in the Krammer Volkerak, lack of oxygen in the Grevelingenmeer, and the deciline of sand plates and fish migration in all the water bodies. [Programmabureau Zuidwestelijk Delta, 2009] Today, these problems triggered the discussion of re-opening the estuaries of the Dutch Southwest Delta.

The graduation project provides research by design on the spatial implementation of the paradigm 'working with nature' in an open Dutch Southwest Delta. The open delta scenario, as proposed by H+N+S (Toekomstbeeld ZW Delta) and WNF (Met Open Armen), gradually restores the delta dynamics in the Krammer Volkerak. The process towards an open delta not only provides a form of the urban landscape. It also contains a new and innovative approach by integrally constituting value in the urban, cultural and natural layer. The new relation of delta cities with water, nature development combined with fresh water storage and day-recreation depict a scenario that sustains the dynamics of a natural delta landscape, social initiative and the improvement of the socio-economic condition of the delta cities Oude Tonge and Ooltgensplaat. A possible future of an open delta.





Lost large scale relation with water In the Medieval period Goeree Overflakkee existed ofa dune with the village of Ouddorp and multiple sand plates. The inter tidal area did not contain any villages or settlements and belonged to the vagaries of natural processes. The delta was a rich fishing ground and an ideal place for trade, and thus for urbanization. The plates were surrounded by a ring dike and cultivated. Villages were founded at the (main) creek of the reclamated sand plate. The creek provided water discharge of the polder and in addition kept the harbor open (from sedimentation). The accretion of sediment. The process of sedimentation and reclamation show that early delta cities that once lay on water have been embedded in the island and have been transformed from a harbor city in a polder



'Zachte Berk' Betula Pubescens Waterstorage of the creek network 'Ratelpopulier' 'Knotwilg' Populus Tremula Salix Alba From cultural to natural landscape The process towards an open delta in combi-

Rain storms occur more often and the discharge and storage of this rain water is acking on the island of Goeree Overflakkee, esulting in lost of crops due to high groundnation with the paradigm 'working with nature' provides a design attitude that let water levels in an already wet environment nature provide solutions and value to an provide waterstorage and rain wate urban landscape. The extended creek discharge on the island the historic creek network is restored and connected to each network, based on historic creeks, transforms during the phases from a cultural other. This will provide the farmers and agricultural businesses protection for their crops. In addition, with a possible re-establishing of an open delta, the sedimentation process will re-occur in the Krammer Volkerak. High discharge is also benificial to keep the harbor and the canal







PROGRAMMA BUREAU ZUIDWESTELIJKE DELTA (2009), Toekomstbeeld Zuidwestelijke Delta 2050. Retrieved 10 september 2011, from:http://www.zwdelta.nl/dyna misch/bibliotheek/70\_0\_NL\_Toekomstbeeld\_def1.pdf.

'Oude Kerk' (Hervormd), Oude Tonge, 2012 The Dutch Southwest Delta is located in Photo by: N. den Besten Lost small scale relation with water

R&D Location

or maintained element in the landscape to an area given back to nature providing both water storage, nature development and an attractive recreation route. The first stage of the transformation of the creek is that it is used for inundation and in the following phases the inundation polder is given back to nature in which hard edges become soft and flora and fauna find residence.







ew urban relation(s) with nature The concept for the urban extension is to combine an enhanced water defense with a re-vitalized harbor. The new housing are a face to the intertidal area and the promenade a recreative walking route for the inhabitants of Oude Tonge. The harbor is the spindle between the main street (from the church ring) to the intertidal area and the

The Krammer Volkerak becomes a part of the program Room for the River (RvR) by developing an inundation area. Although the frequency of flooding will be low, the area will be without housing. And assigned for nature development. This can be related to a water bridges the height difference of the closely related project in Zuid Holland:

Tiengemeten (Natuur-monumenten), where

Room for the River [RvR]

ship canal (to the harbor). The L-shape in the harbor re-introduces the characteristic and historic shape but has a touch to it. Instead of a quay the harbor is designed as a public space where people on a small scale can relate to water. The stairs leading to the square and the water. In addition, the old

water ditch of the church ring is restored to



Mar. Mar. Car

and it is

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Towards an (des)integrated dike As part of the design attitude 'from cultural' to natural' the dike transforms from a hard border between open water and polder to a landscape that provides natural water defense. The 'wierden' can transform during different phases from a natural forest to landscape living.



'Zeeaster' Aster Tripolium

Epigejos



Day recreation The recreation route showcases the









From inundation to intertidal area The Dutch Southwest Delta is re-opened as part of the plan of ZW Delta and H+N+S Landscape architects. Tidal dynamics are restored and will provide a water level difference of 1,0m to 1,5m. The watergates built to let the area be inundated will now be set open to establish an ecologic transformation in the inundation area or intertidal area. The open delta in this phase is a controlled



‡6,0 - 6,8 m

1,0 - 1,5 m





Living in a transforming landscap

The dynamic landscape of the intertidal area





Living in the contact zone The ecologic transformation from a fresh water ecology to a brackish ecology continprovide new flora (and fauna) in the Krammer Volkerak. Inhabitants of the modern castles will witness a process of changing vegetation. From 'engels slijkgras' to 'strandkweek' and 'zeeaster'. The intertidal area could in this sense also be





As the outer dike, the inner dike transforms from a hard border to an integrated element Krammer Volkerak is natural and relates the intertidal area with the polder area.







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