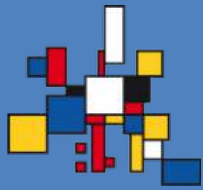


Keep our feet dry

Exploiting heritage and
heritage knowledge
for climate adaptation
strategies

Menne C. Kosian
Researcher Spatial Analysis
Landscape department



Outline



Climate Change and Cultural Heritage

**Modern problems?
Adaptation strategies**



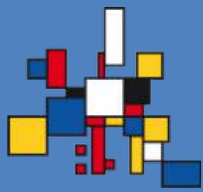
Cultural Heritage and Climate Adaptation

**Protect and reuse
Adaptation and acceptance**

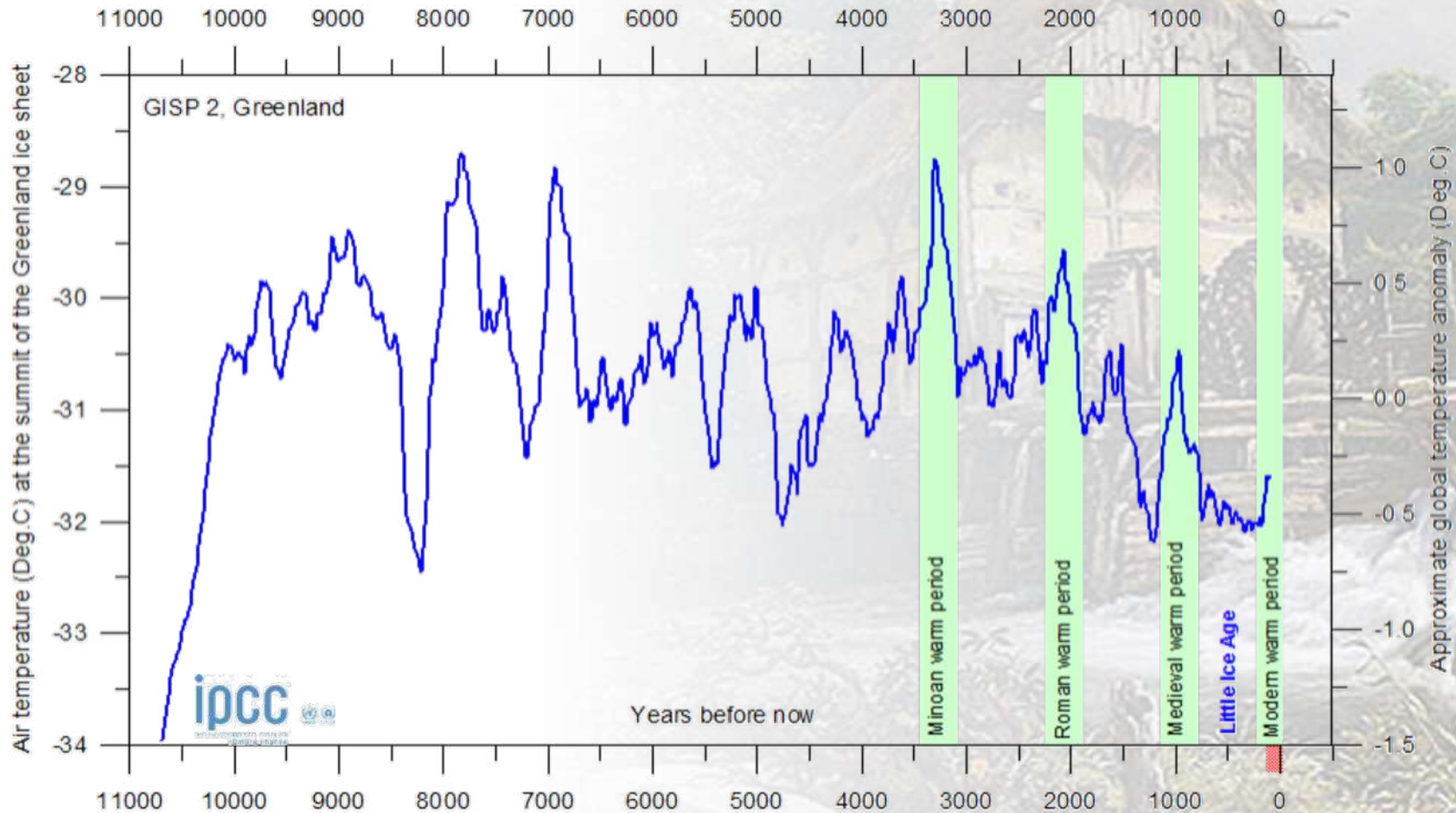


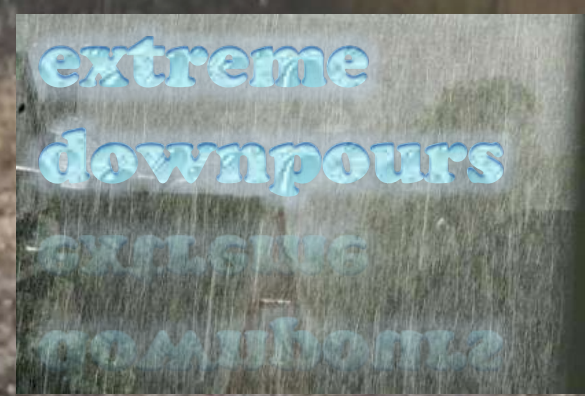
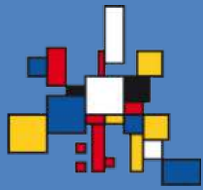
Learning from the past

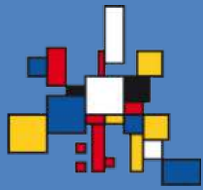
A broad view



Climate change and cultural Heritage Modern problems?



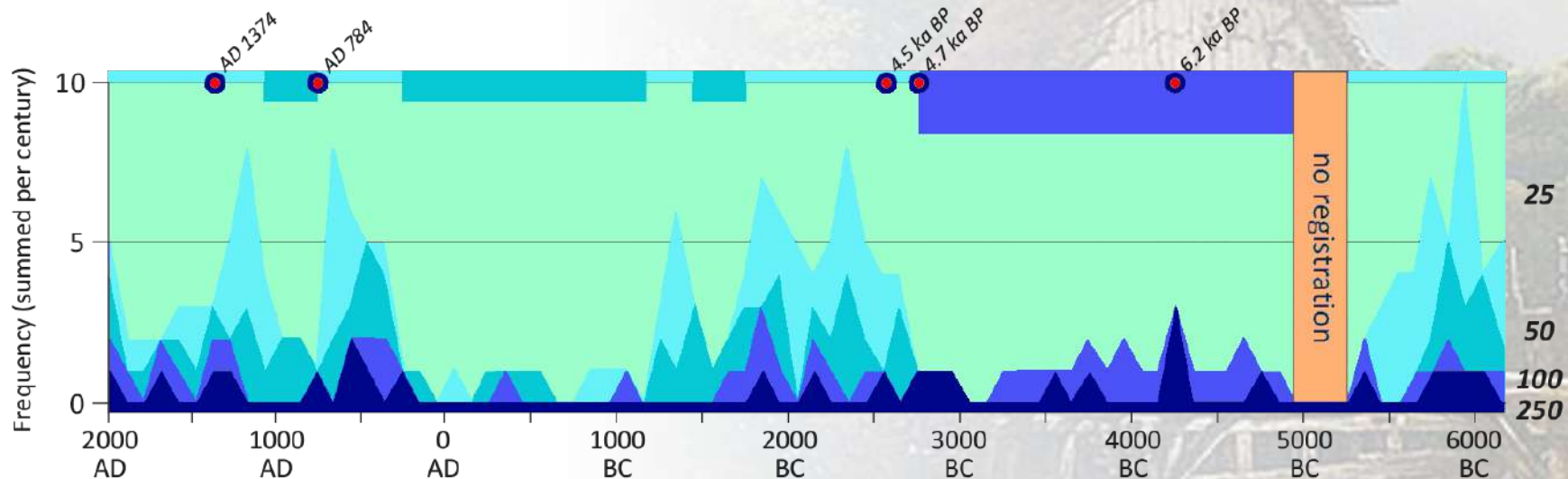




The A2 motorway near 's-Hertogenbosch during the 1995 floods

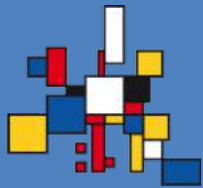
Climate change and cultural Heritage

Modern problems?



Flood frequency per century illustrated by the frequency of various flood magnitudes, exceeding recurrence times of 250, 100, 50, and 25 years and respectively corresponding with dark blue, blue, blue-green and light blue. The timing of millennial floods is indicated by dots at the top of the figure. Lower limits of registration are also shown at the top; shades correspond with the minimum class recorded.

Derived from: Toonen (2013) Phd Thesis Utrecht University



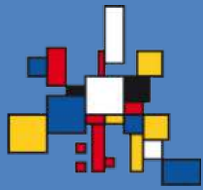
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Gouda 2020 Soil subsidence and rising water level: this is the actual level of the quays of the Turfmarkt



Climate change and cultural Heritage

Modern problems?

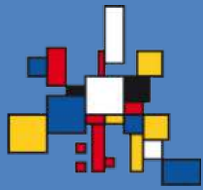


Venice 1825
(Giovanni Grubacs)



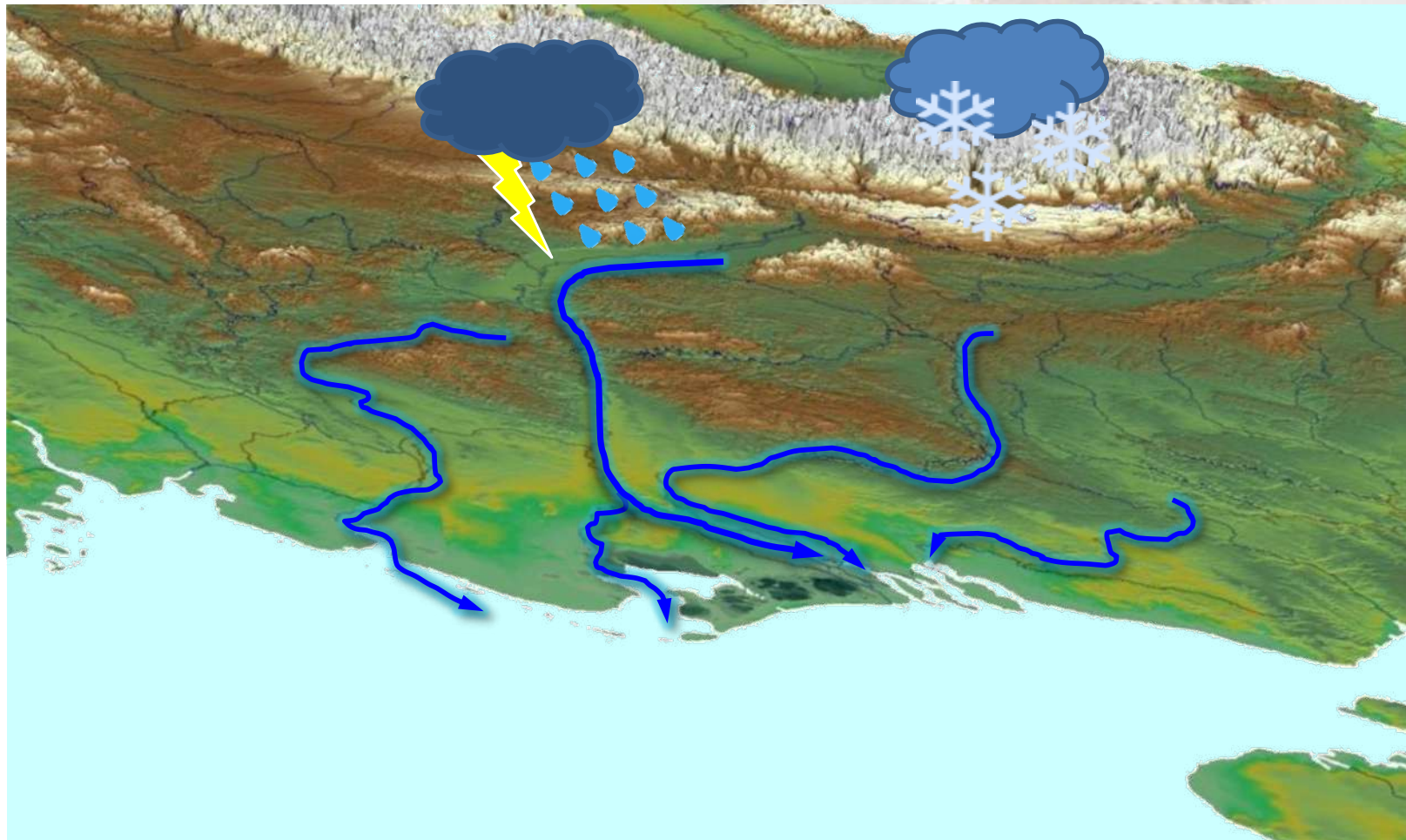
Venice 2019
(Wall Street Journal)

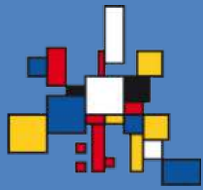




Climate change and cultural Heritage

Adaptation strategies



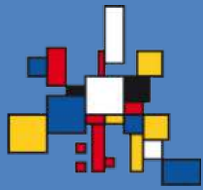


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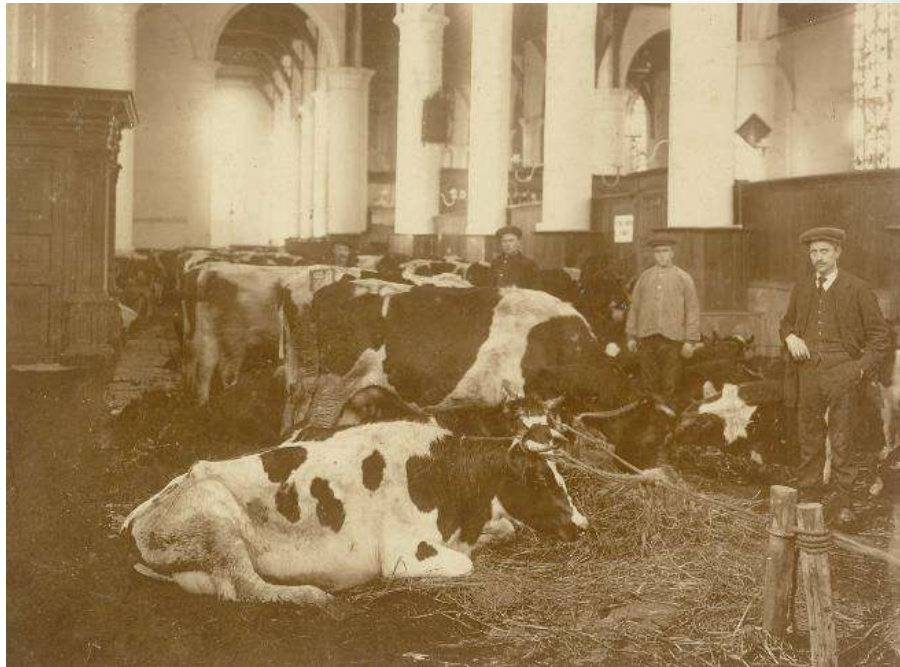


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The *terp* (dwelling mound) of Hegebeintum in Friesland, dating from 600 BC with its 12th century church

Climate change and cultural Heritage Adaptation strategies



Edam 1916
Cows sheltering in the
Grote Kerk church

Zaandam 1825
Cows sheltering in the
Oostzijder church
(Pieter Gerardus van Os)

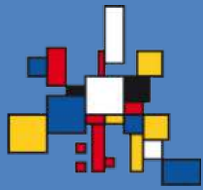


Climate change and cultural Heritage

Adaptation strategies

- ✚ Oldest cities (10th – 11th cent.)
- ✖ Other 12th century cities (11th – 12th cent.)
- ▲ Flemish / Zeeland ports (12th - 13th cent.)
- ★ Products of land lord urban politics and planning (ca. 1200-1250)
- Other 13th century cities (12th – 13th cent.)
- ◆ Western ports (ca. 1270 – 1400)
- Late-Medieval new towns (ca. 1270 – 1400)





Climate change and cultural Heritage Adaptation strategies



Hangchow



Nürnberg



Byzantium



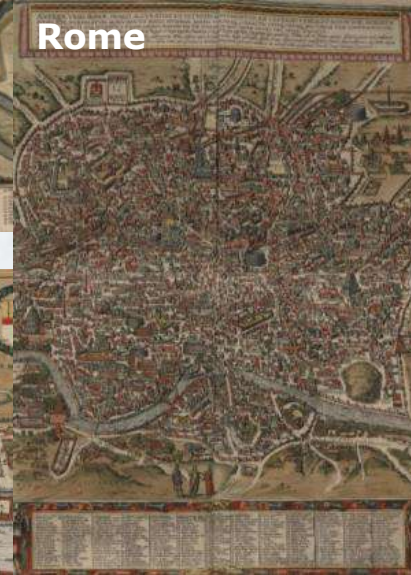
Bilbao



Paris



London



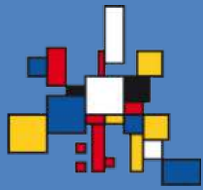
Rome



Goa



Córdoba

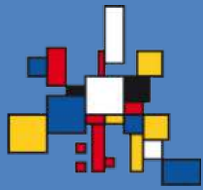


Climate change and cultural Heritage

Adaptation strategies



Pumping 4+ meters of sand on the southern IJ-river shores for the new ports of Amsterdam (1963)



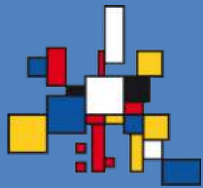
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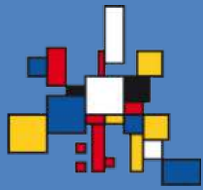


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Raising the terrain for the Bijlmermeer housing estate of Amsterdam (1968) covering the peat landscape

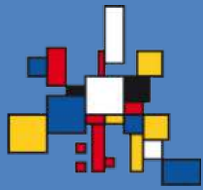




Cultural Heritage and Climate Adaptation

Protect by reuse

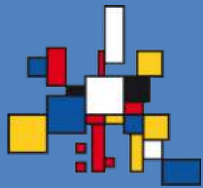




Cultural Heritage and Climate Adaptation

Protect by reuse

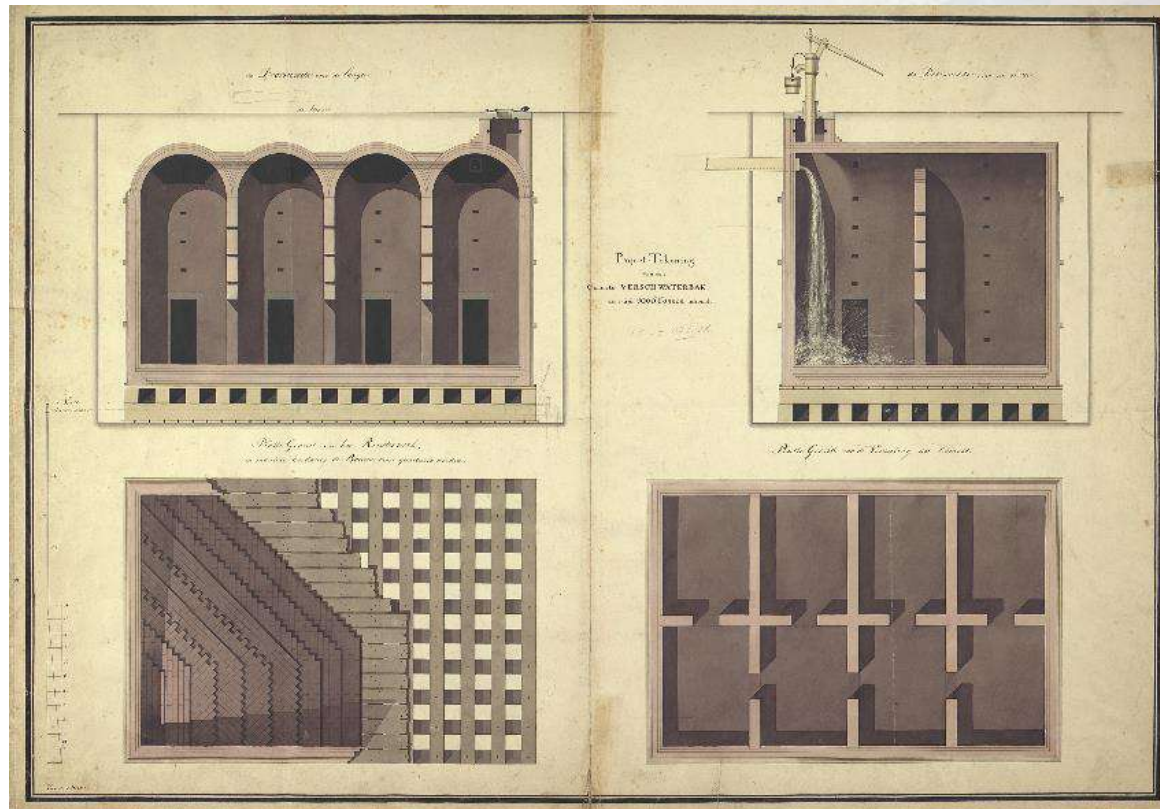




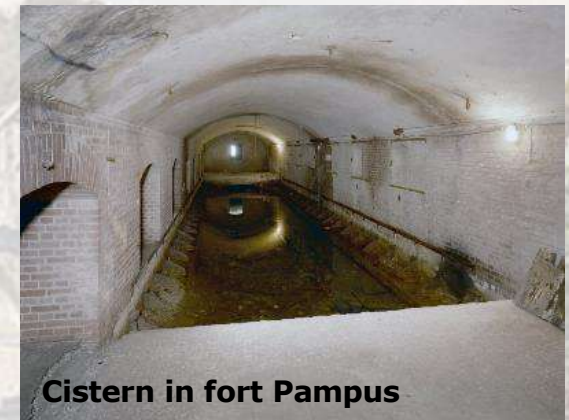
Cisterns in Copenhagen

Cultural Heritage and Climate Adaptation

Protect by reuse



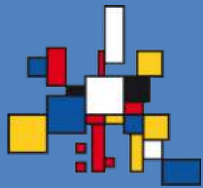
Amsterdam 1806 Design for a 1000 metric ton cistern (A. Van der Hart)



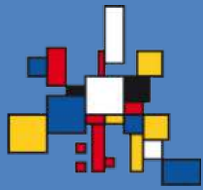
Cistern in fort Pampus



Water cellar under Lauriergracht 116 Amsterdam



A Cold War nuclear shelter in the city of Arnhem, to be reused as water cellar (*De Volkskrant*, 11 8 2020)



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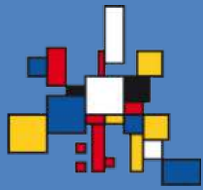
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Adaptation and acceptance

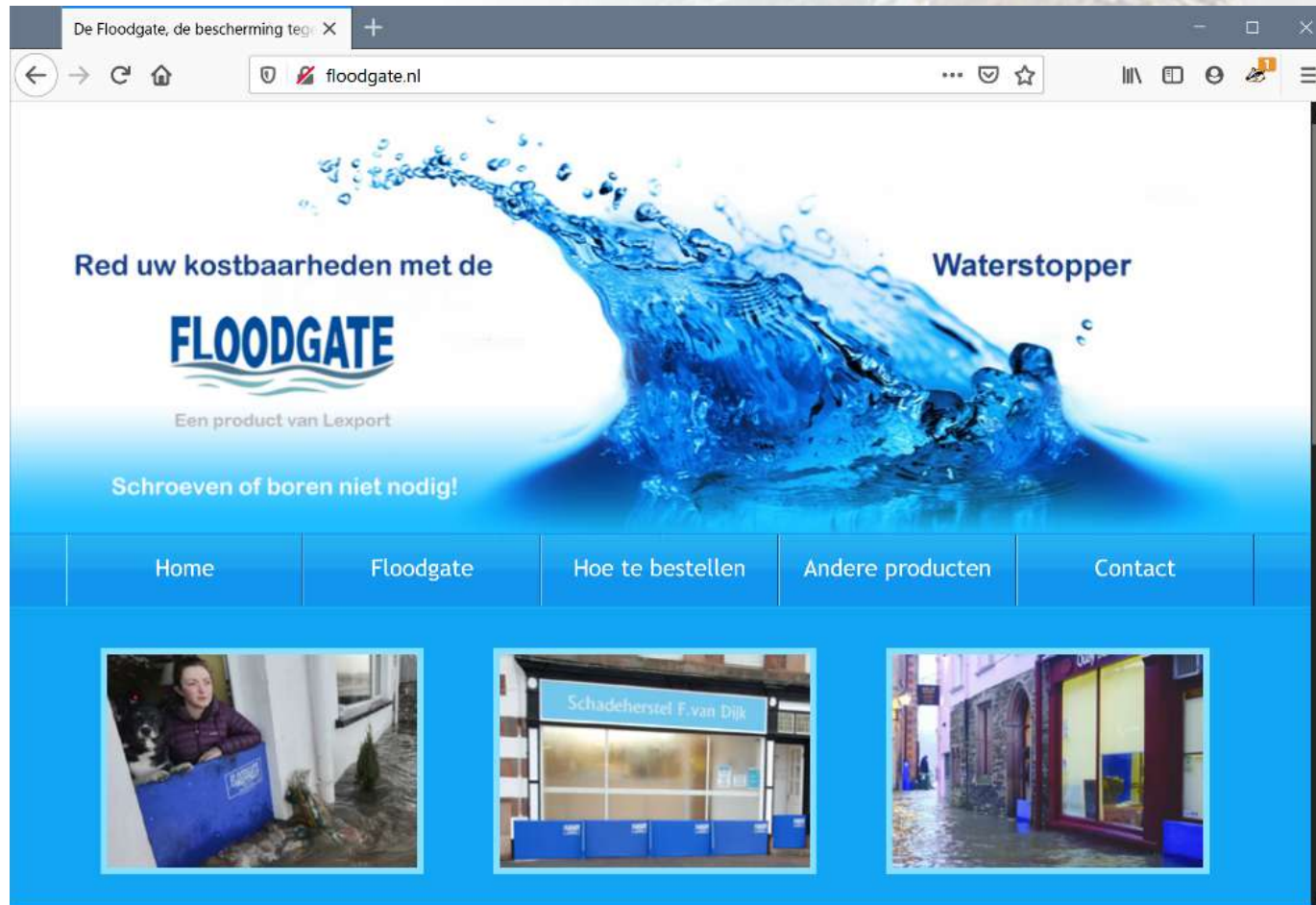


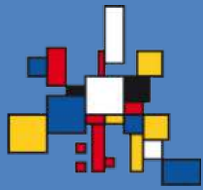
**Schiedam (1955) *Hoofdstraat*.
Grocery shop of VanLelieveld
Boarded up against high water.
(C. de Breur)**



Cultural Heritage and Climate Adaptation

Adaptation and acceptance



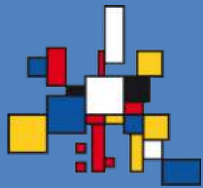


Cultural Heritage and Climate Adaptation

Adaptation and acceptance



Kampen (2018) citizens high water brigade on exercise
Characteristic local history as future protection plan



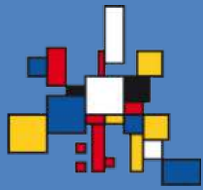
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The D.F. Wouda steam pumping station (1920) at Lemmer, Friesland in full pumping action



Learning from the past A broad view



E WATERBUFFER ERP ERP



Het wensbeeld

- ontwikkeling van een klimaatbestendig dorpskern
- integrale aanpak van wateropgaven met kansen voor natuur, recreatie en sport
- beekherstel en potentiële waterbergingslocatie
- verbeteren ruimtelijke kwaliteit van de ligging van Erp aan de Aa
- verbeteren recreatieve verbindingen met het dorp
- realisatie ecologische verbindingzone
- benutten van kansen voor water- en oeverrecreatie

De eerste stap op weg naar de uitvoering

- kwantificeren wateropgave
- benoemen ontwikkelingszones

Samenhang met andere projecten (of clusters van kansen)

- van Aa-broeken naar centrum Veghel
- klimaatbestendige steden en dorpen

Organisatie

- projectregisseur (wensbeeld): gemeente Veghel
- trekker uitvoering deelproject: -

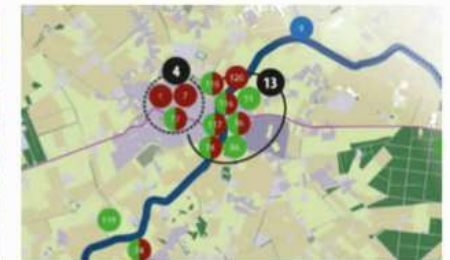
Overige betrokken partijen

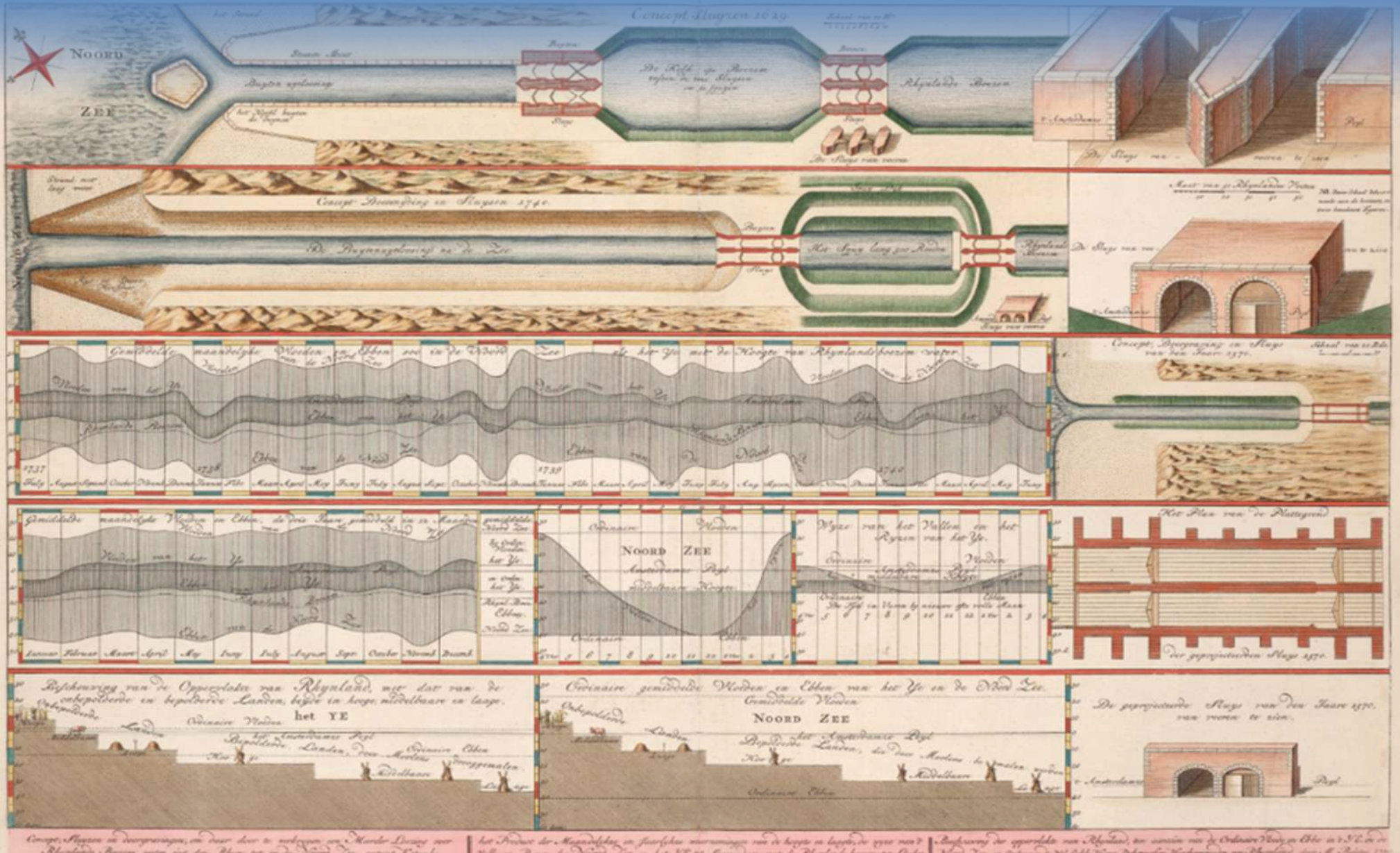
Waterschap Aa en Maas, sportverenigingen, IVN Veghel, bewoners en ondernemers



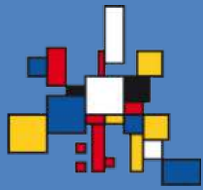
nr	kansen die invulling geven / aansluiten bij icoonproject *
51	nieuw leven voor watermolenlandschap in het beekdal
74	kanoroute van Beek en Donk naar Keldonk
86	realisatie van uitzichtpunten langs de Aa
96	integrale benadering water, groene recreatie en natuur (Sportpark Erp)
116	realisatie van een nieuwe kantine op Sportpark Erp boven de Aa
117	aanleggen extra oversteek over de Aa voor wandelaars en fietsers
118	aanleg voetpad van oostrand van Erp (Heesakker) naar sportpark
120	realisatie brug over de Aa voor vrachtwagen richting Molenaar

* Icoonprojecten bevatten kansen die qua ambitie en doelstelling aansluiten bij de verkenning voor het Aa-dal. Zij leveren een bijdrage aan de wateropgaven en/of aan de versterking van de ruimtelijke kwaliteit in het beekdal van de Aa. De kansen zijn in de zomer van 2016 verzameld vanuit de streek. Er heeft (nog) geen toetsing plaatsgevonden op de haalbaarheid van de geïnventariseerde kansen en de mate waarin zij aansluiten bij het ruimtelijk beleid van de betrokken gemeente(n), provincie en waterschap.







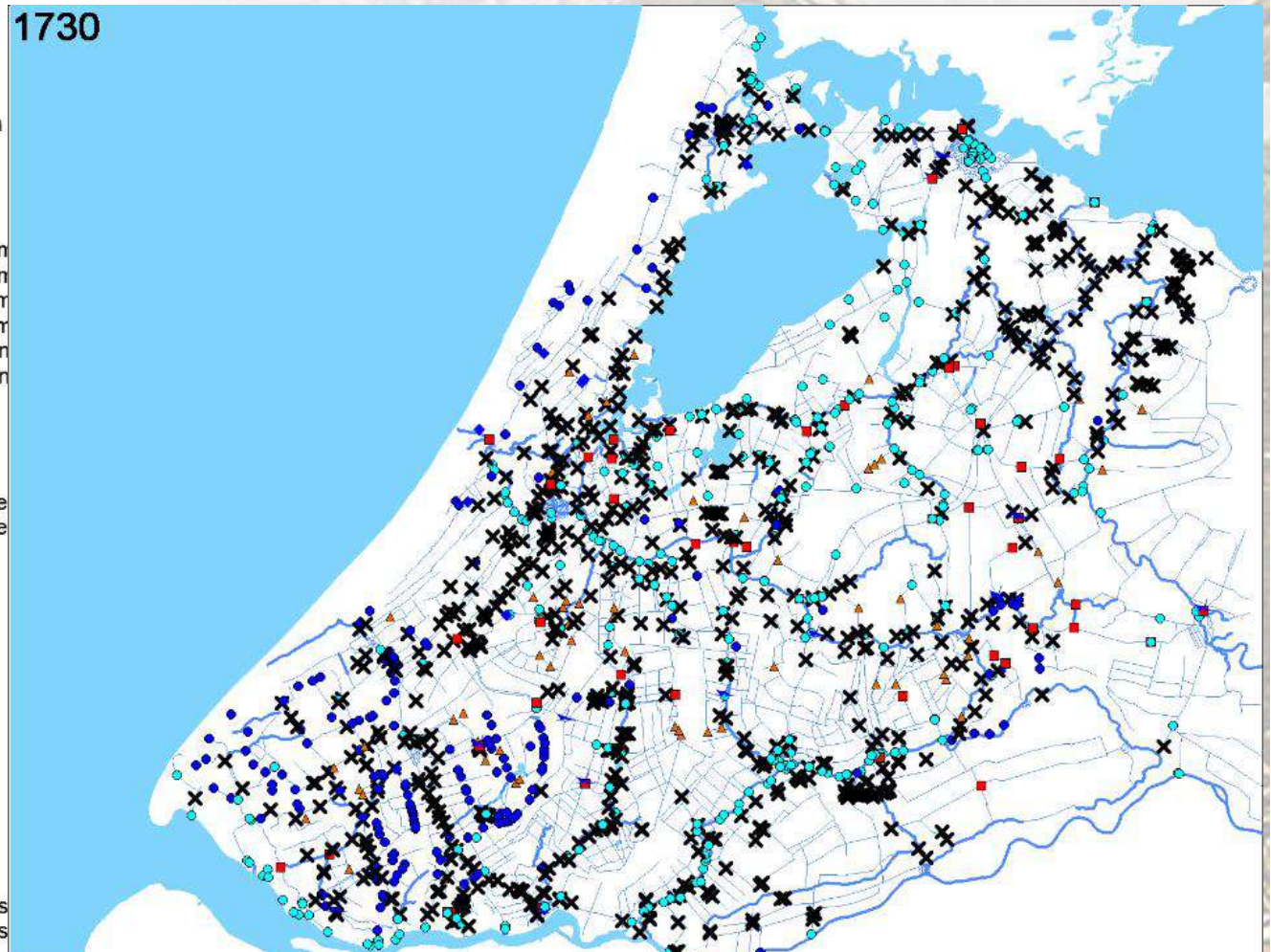


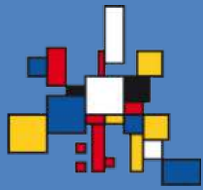
Learning from the past A broad view

Digging into works

- | | | |
|--------------------------|----------------------|----------------|
| ■ dam | Amstel | — Kromme Rijn |
| ✳ portage | Amstel | — Gouwe |
| ◆ sluice | De Bijleveld | — Gouwe |
| — culvert | Amsterdam-Rijnkanaal | — Spaarne |
| ✕ windmill (polder mill) | Amsterdam-Rijnkanaal | — Spaarne |
| ⊥ pumping station | Boonervliet | — Haarlemmern |
| ◆ pump | Delfhavense Schie | — Haarlemmern |
| ▲ barge canal bridge | Delfhavense Schie | — Braassemern |
| — Verversingskanaal | Noordvliet | — Braassemern |
| — Verversingskanaal | Noordvliet | — Kagerplassen |
| — Schie | Rotterdamse Schie | — Kagerplassen |
| — Schie | Rotterdamse Schie | — Rotte |
| — Zweth | — Verversingskanaal | — Vecht |
| — Zweth | — Verversingskanaal | — Vecht |
| — Vliet | — Schie | — Loosdrechtse |
| — Vliet | — Schie | — Loosdrechtse |
| — Hollandse IJssel | — Zweth | — De Heikop |
| — Lek | — Vliet | — De Heikop |
| — Lek | — Hollandse IJssel | — zandgebied |
| — Rijn | — Lek | — zandgebied |
| — Rijn | — Rijn | — IJsselmeer |
| — Oude Rijn | — Oude Rijn | — IJsselmeer |
| — Oude Rijn | — Leidse Rijn | — Noordzee |
| — Leidse Rijn | — Leidse Rijn | — Noordzee |
| — Leidse Rijn | — Kromme Rijn | — Zuiderzee |
| — Kromme Rijn | | — Zuiderzee |
| | | — Zijkanaal F |
| | | — Zijkanaal F |
| | | — IJ |
| | | — IJ |
| | | — Nieuwe Maas |
| | | — Nieuwe Maas |

1730





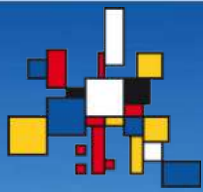
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The 17th century sluices in the Haarlemmervaart (Amsterdam)



Cultural Heritage Agency of the Netherlands
*Ministry of Education, Culture and
Science*

**Thank you for
your attention**

