



Università  
Ca' Foscari  
Venezia

WATER-CULTURES PROJECT  
The Water Cultures of Italy, 1500-1900  
ERC-2018 - Advanced Grant - 833834  
P.I. Prof. DAVID GENTILCORE



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# Liquid Capabilities Partecipatory Water Cultures in the History of the Low Countries

Tim Soens

Venice, 25 November 2022

*Liquid Capabilities*  
*Participatory Water Cultures in the history of*  
*the Low Countries.*

Tim Soens

Centre for Urban History | AIPRIL | UAntwerpen

# From one lagoon to another





## Dante Alighieri, *Divina Commedia*, Canto XV (c. 1308-1320)

- *Quali Fiamminghi tra Guizzante e Bruggia; temendo 'l fiotto che 'nver' lor s'avventa, fanno lo schermo perché 'l mar si fuggia*
- Just as between Wissant and Bruges, the **Flemings**, in terror of the tide that floods toward them, have built a **wall of dykes** to daunt the sea

# A new polder in 18th century Flanders

Source: Fond. Arenberg

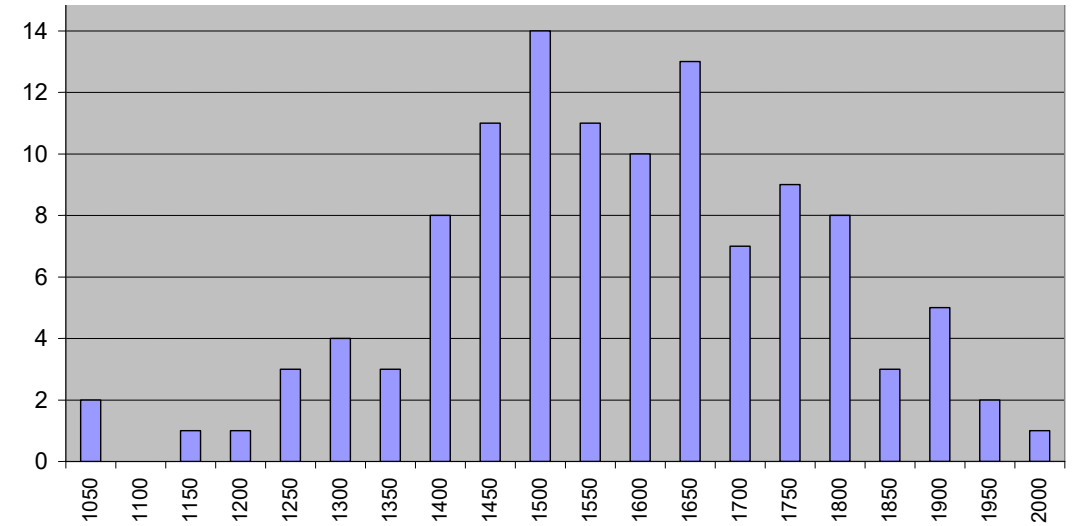






## Pieter Pourbus: environment of Bruges

- With dike and dike breaches in white

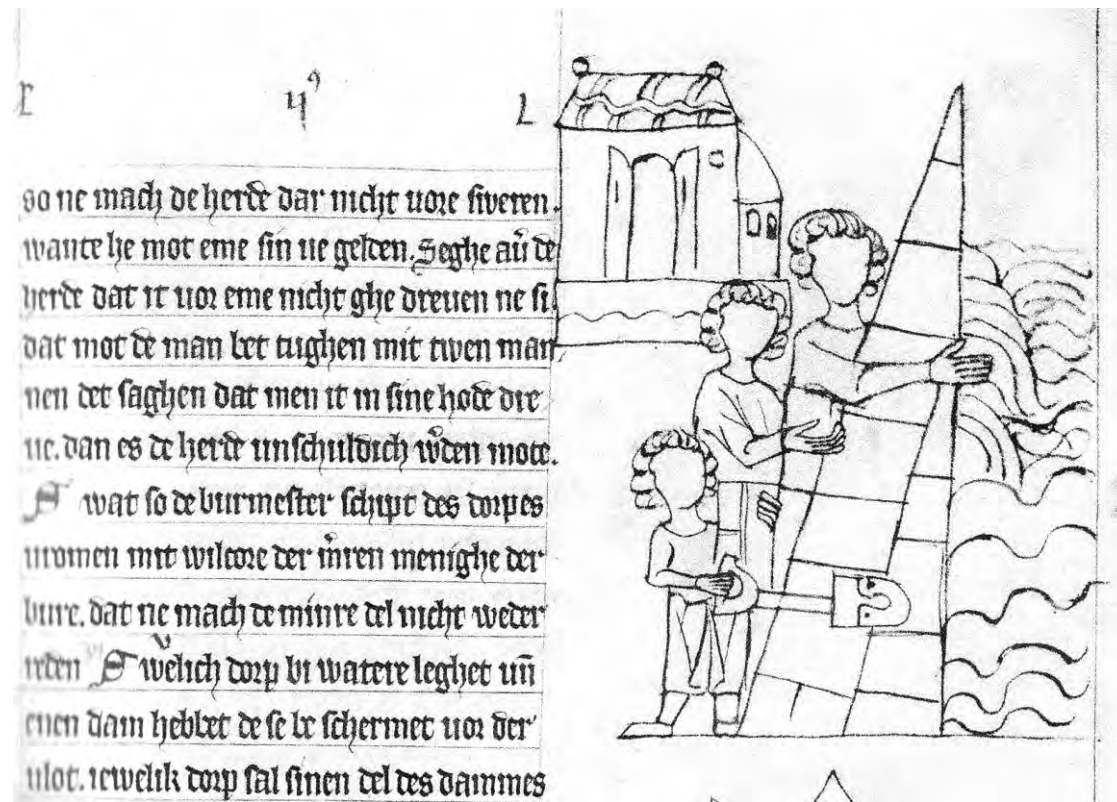


## Storm Surges & Dike Breaches per century

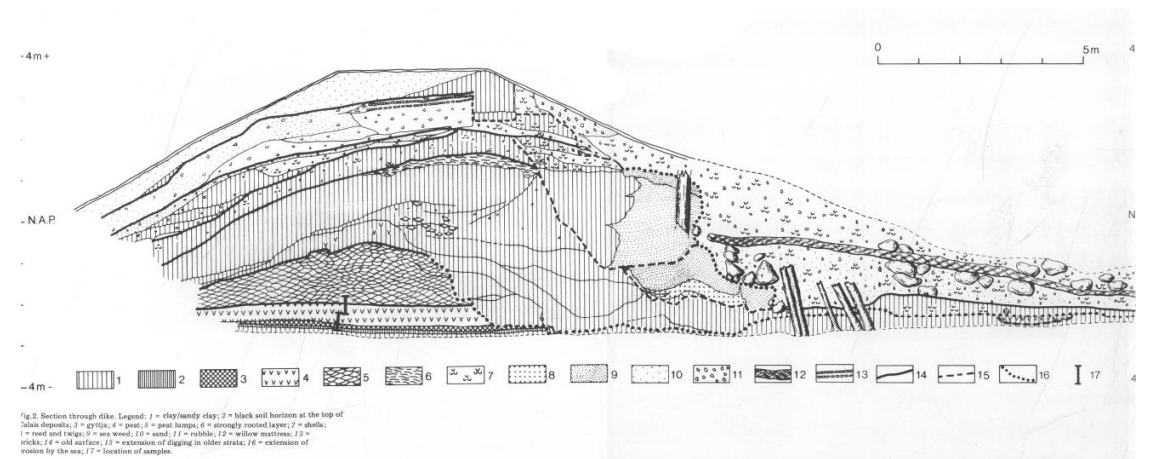
- At least 1 major flood event per 20 year

# Dykes = Work in Progress

## Sachsenspiegel 1336



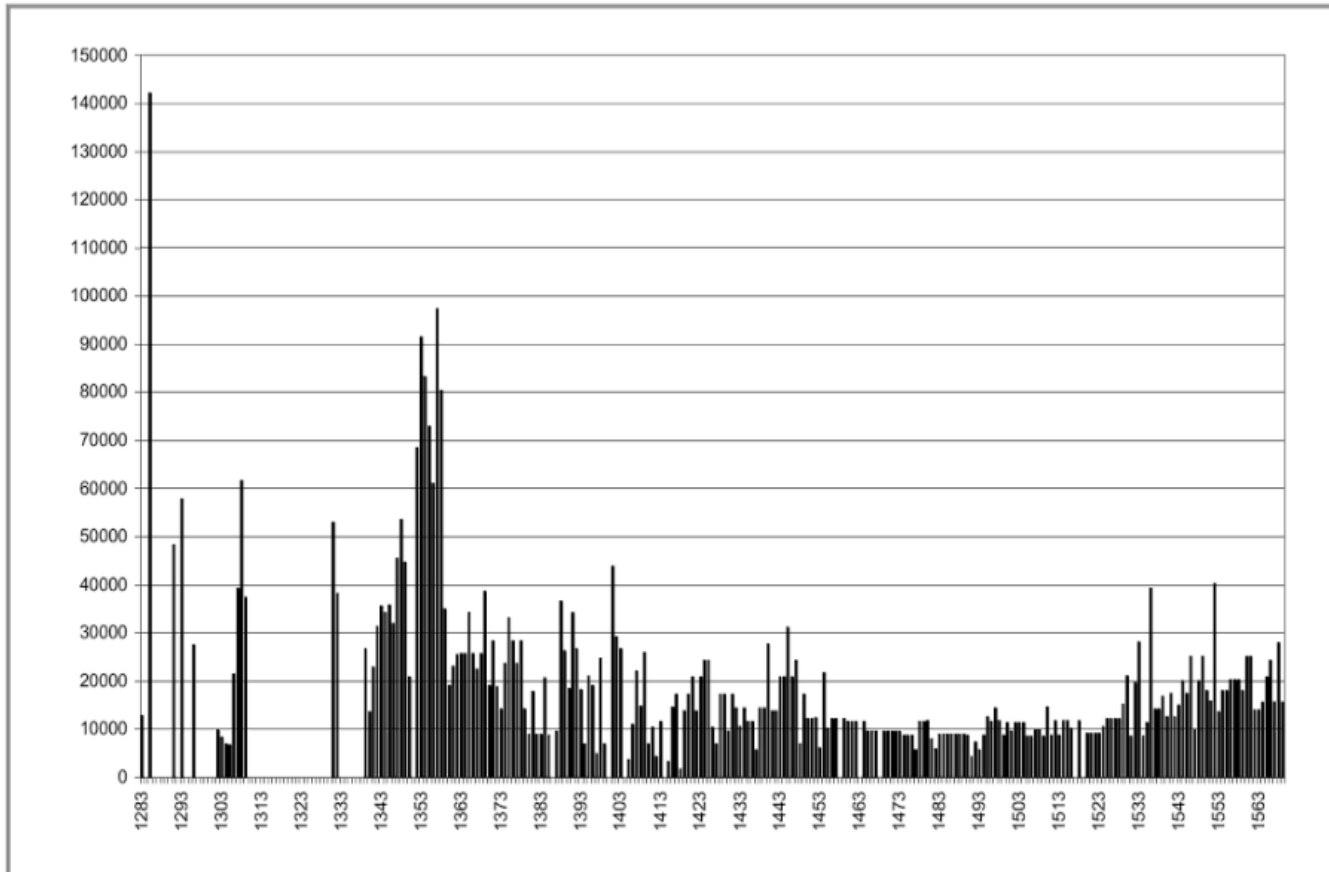
## Profile Westfriese Omringdijk Enkhuizen (N-Holland)





# A lot of work

- Up to 140000 man-days per year in one (large) polder



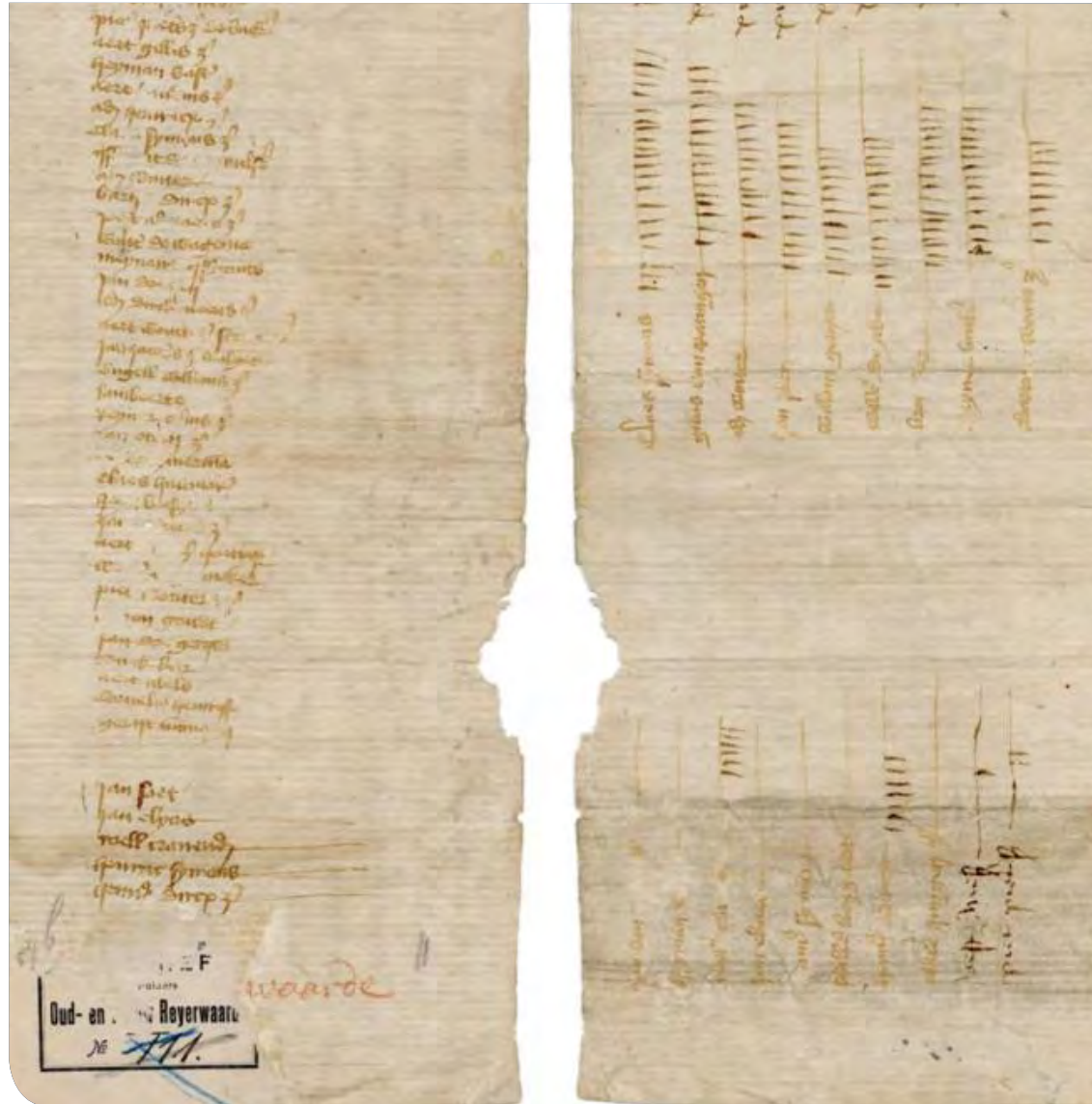
*Figuur 3.4.* Totale opbrengst van het geschot in de Blankenbergse watering, uitgedrukt in daglonen van een ongeschoold arbeider.

# 1/3 Polder Democracies



## Debating Water: the new sluice of Blankenberge

- *Meente*: General assembly of Landowners
- 16 April – 22 June: 5x
- 17000 hectares ; 2000-landowners
  
- *int openbare ende overluidt*
- *twelke der meentucht vele te vele dochte*
- *Twelke... alder meentucht onredelike gheheescht dochte*
- *Twelk eeneghe zeiden dat van gheenre nood ne was te vermakene*
- *bevolen dat ment werken zoude*
  
- *Picture: 13th CE sluice with flap gate, near Rotterdam*

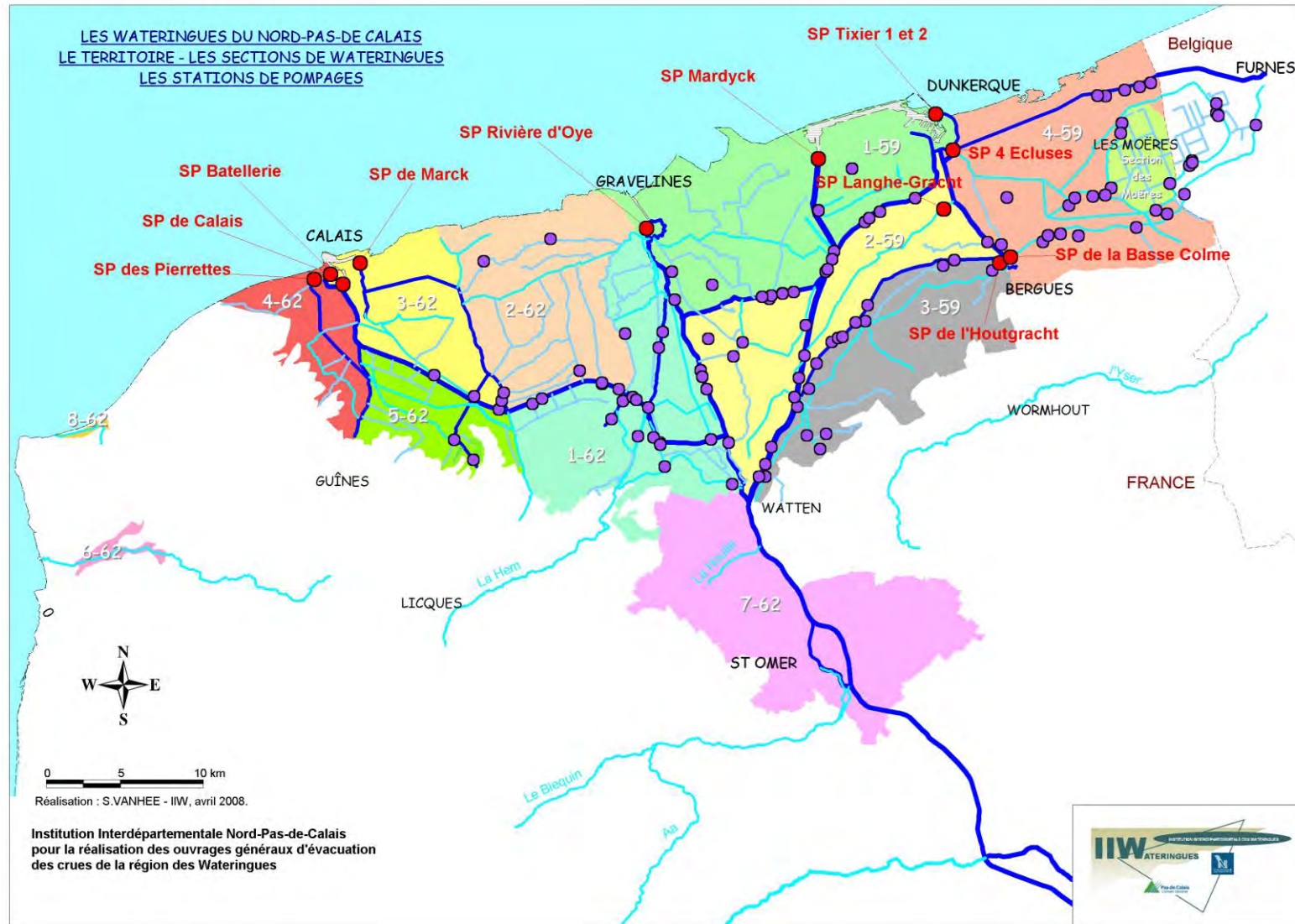


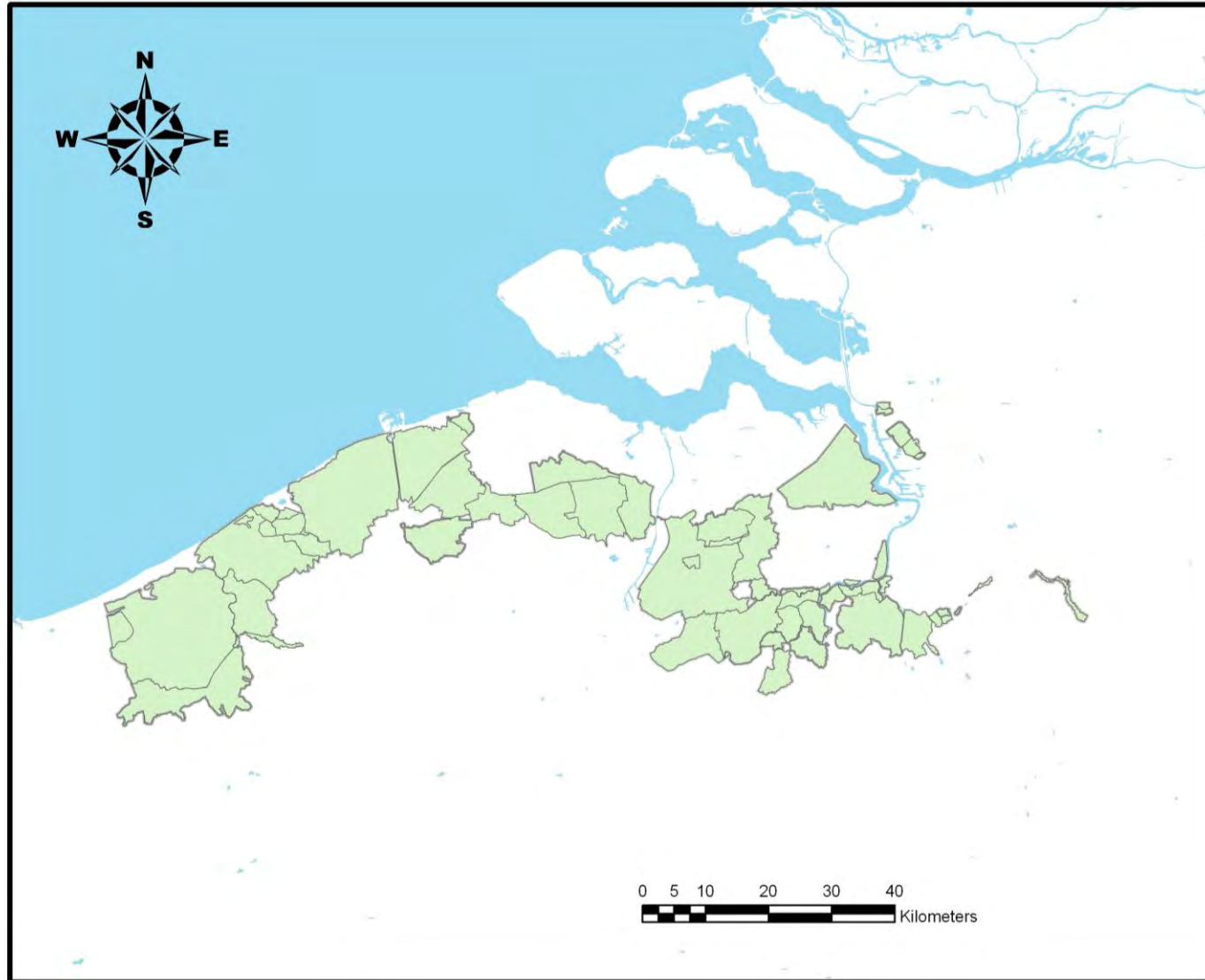
## Voting for the Water Board

- Oud Reijersland, Holland, c. 1459
- (GA Rotterdam)

# In N France

- Wateringues Nord-Pas de Calais





## In Belgium / Flanders

- Coastal &  
Scheldt Polders

Landesverband von rund 500 Wasser- und Bodenverbänden

**Aufgaben:**

- Vertretung und Beratung der Verbände
- Förderung von Landwirtschaft, Wasserwirtschaft und Naturschutz
- Auszahlung der Landeszuschüsse
- Kontrolle der Haushaltsführung
- Unterstützung bei Umsetzung WRRL

**Organe:**

- Vorstand mit 5 Mitgliedern  
tagt ca. 6x im Jahr
- Ausschuss mit 38 Mitgliedern  
tagt ca. 2x im Jahr

**Mitglieder:**

- 4 Bearbeitungsgebietsverbände
- 50 Deich- und Gewässerunterhaltungsverbände
- 3 Wasserbeschaffungsverbände

**Aufgaben der Mitglieder:**

- Planen des ländlichen Raums in ganz Schleswig - Holstein:
- Deich-, Gewässer- und Schöpfwerksunterhaltung
- Trinkwasserversorgung
- Abwasserbeseitigung  
(Windschutz)  
(Beregnung)
- Führung in den Arbeitsgruppen zur  
Umsetzung der Wasserrahmenrichtlinie

**Flächeneinteilung zur Umsetzung  
der Wasserrahmenrichtlinie**

**Flächeneinheiten:**

- Eider
- Elbe
- Schlei / Trave
- 34 Bearbeitungsgebiete
- 450 Deich- und  
Gewässerunterhaltungsverbände

## Landesverband der Wasser - und Bodenverbände Schleswig - Holstein

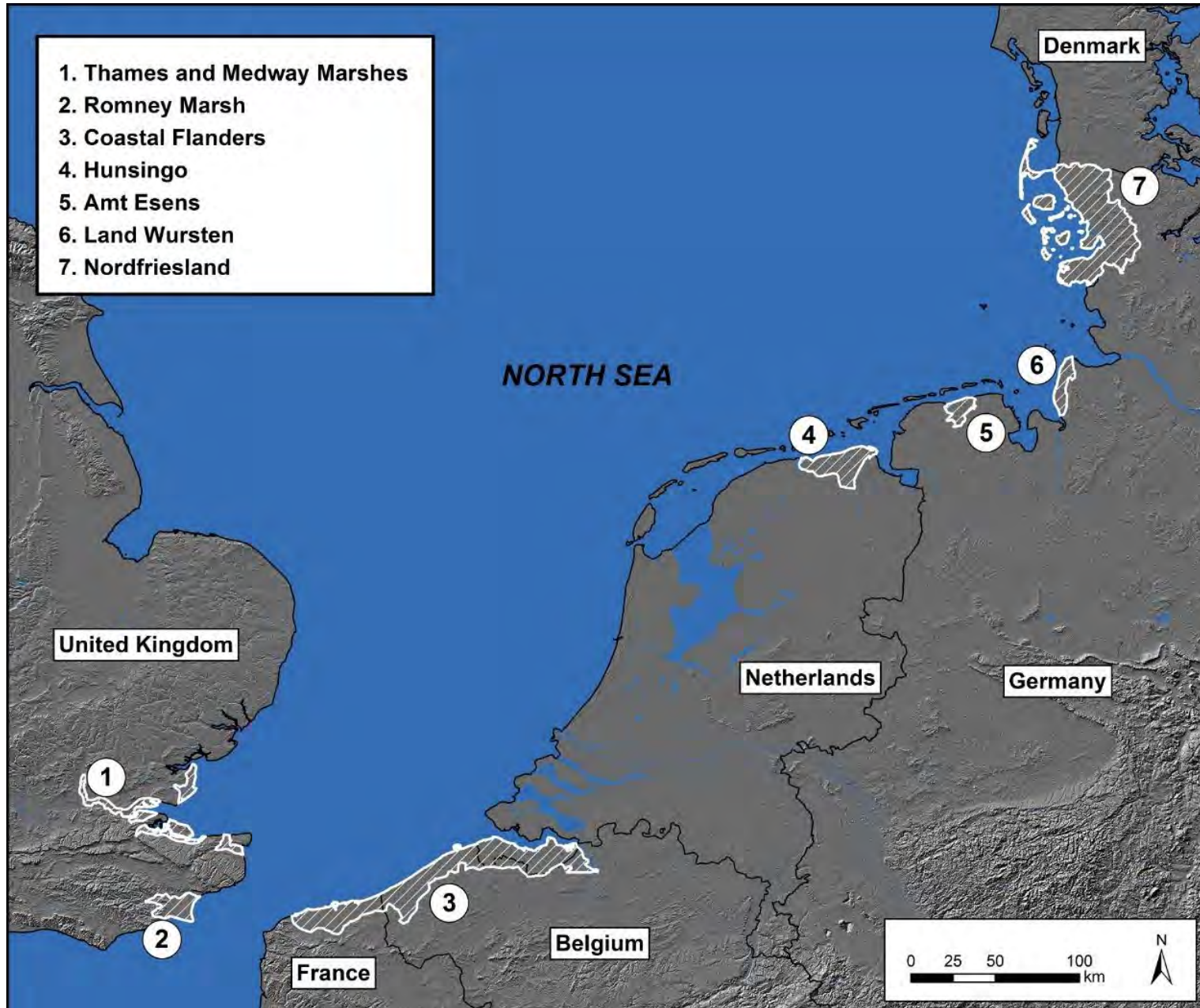
(www.lwbv.de)  
Jungfernstieg 2  
24768 Rendsburg



# In N Germany

- Deutscher Bund der  
verbandlichen  
Wasserwirtschaft (DBVW):  
1850  
associations
- (c. 500 in  
Schleswig-  
Holstein)

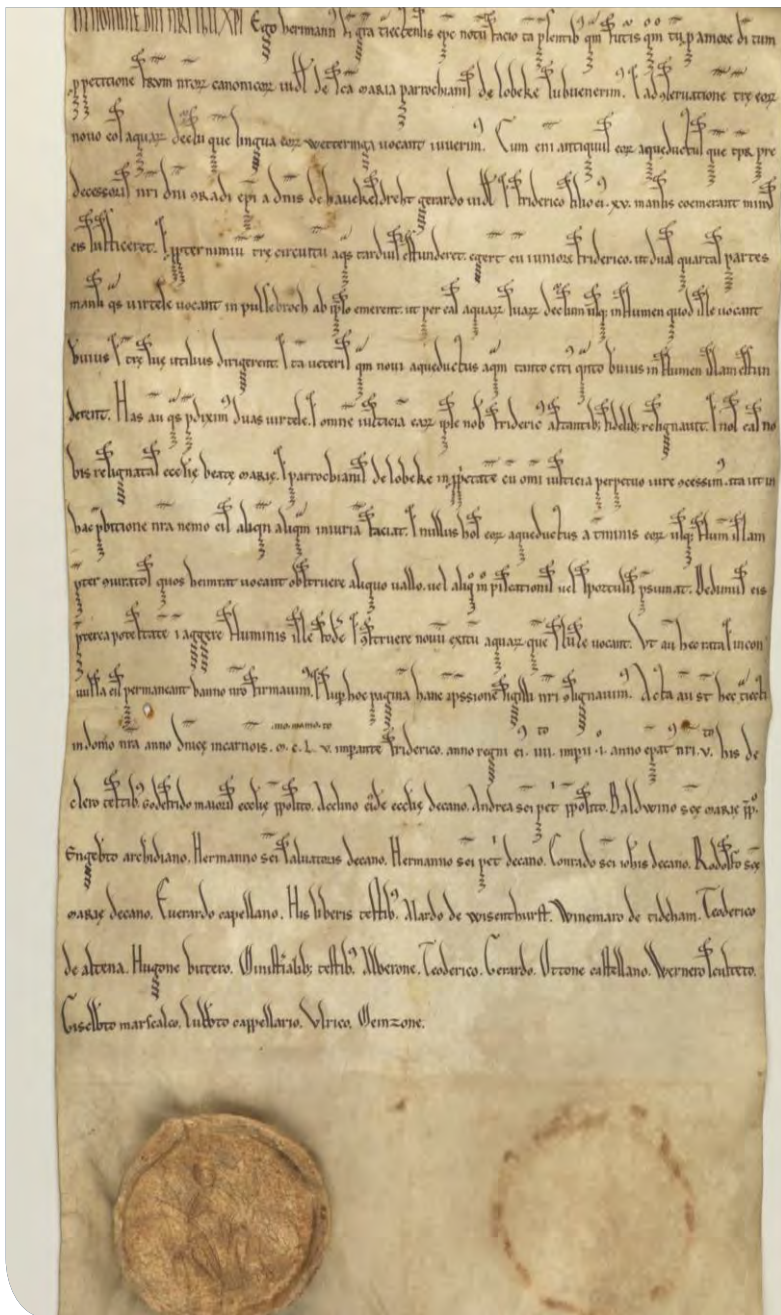
# A North Sea Story





# The origins of Water Boards.

- Until 13th century: part of village governance:
- Ex. *Scultetus Hulst Zeeland Flanders 1234:*
  - *“Quotiens etiam necesse fuerit, debemus ad dicum accedere et bannum facere ut omnes qui terras habent in officio de Hulst... faciant dicum suum tam bonum et tam validum quod scabini recognoscant quod terre... possint secure et salve ab omni periculo et dampno permanere”*



# The origins of Water Boards

- 1155 *Ego Herimannus, Dei gracia Traiectensis episcopus*
- **parrochianis de Lobeke** subvenerimus et ad conservationem terre eorum **novo eos aquarum decursu**, quem lingua eorum *wetteringa* vocant, juverimus....
- parrochianis de Lobeke **in proprietatem cum omni justicia perpetuo jure concessimus**, ita ut in hac prebitione nostra nemo eis aliquando aliquam injuriam faciat et nullus hos eorum aqueductus a terminis eorum usque flumen Islam preter **conjuratos, quos heimrat vocant**, obstruere aliquo vallo vel aliquo modo piscationis vel sportulis presumat.

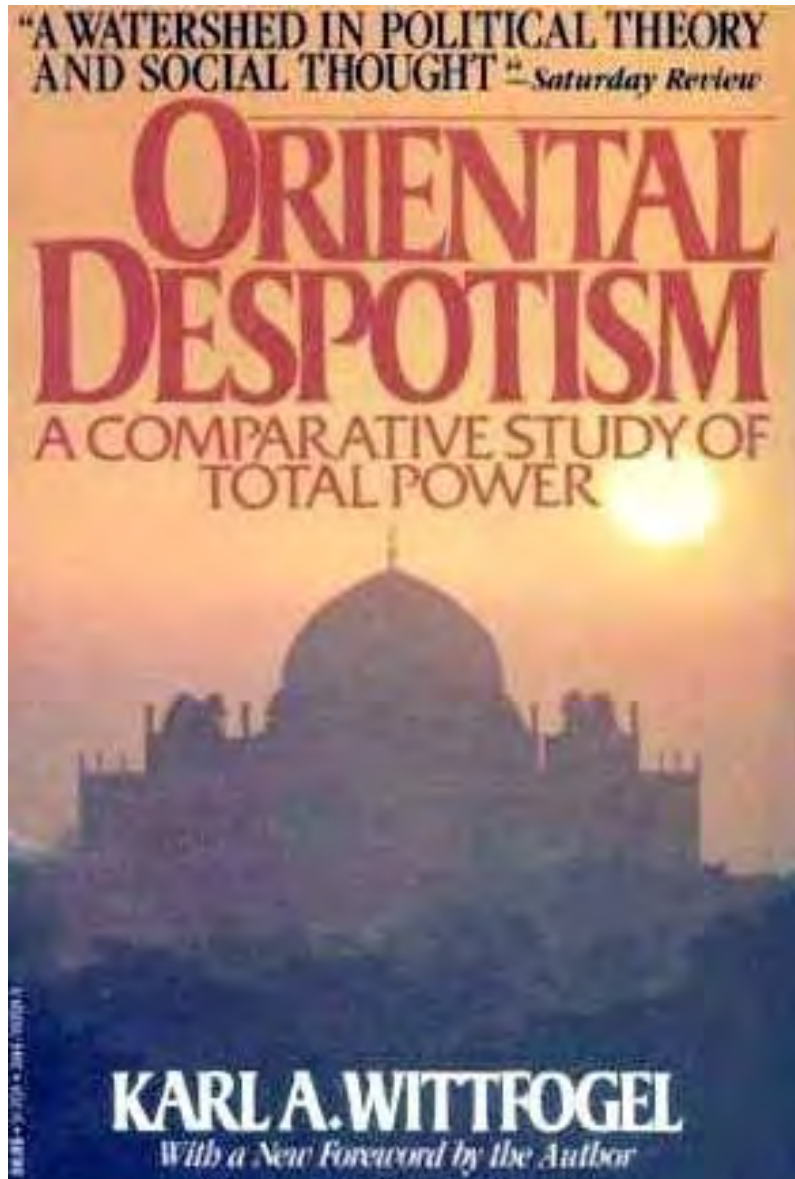


## Specific for the North Sea Area?

- 1156, Codigoro Po Valley
- Abbot of Pomposa imposed labour duties to construct dykes
- But control = a *decanus* and *cavarzallani* as representatives community

# The origins of Water Boards

- 13th century > from inspection to administration
  - Ex. Romney Marsh in England:
    - General meeting landowners: *General Lathe* (~ *leet*)
    - ‘Holders of lands and tenements’ (1258)
    - Payment of *Scot*
      - e.g. Maintenance of the Great Wall of Appledore (1285-)
    - *Jurats*: from inspectors > maintenance



## The Antithesis of Wittfogel's hydraulic Despotism





ELINOR OSTROM

## The Evolution of Institutions for Collective Action



### Institutions for Collective Action?

- **Institutional arrangements** that are **formed by groups of people** in order to overcome certain **common problems** over an extended period of time by **setting certain rules** regarding **access to** the group (membership), **use** of the resources and services the group owns collectively, and **management** of these resources and services



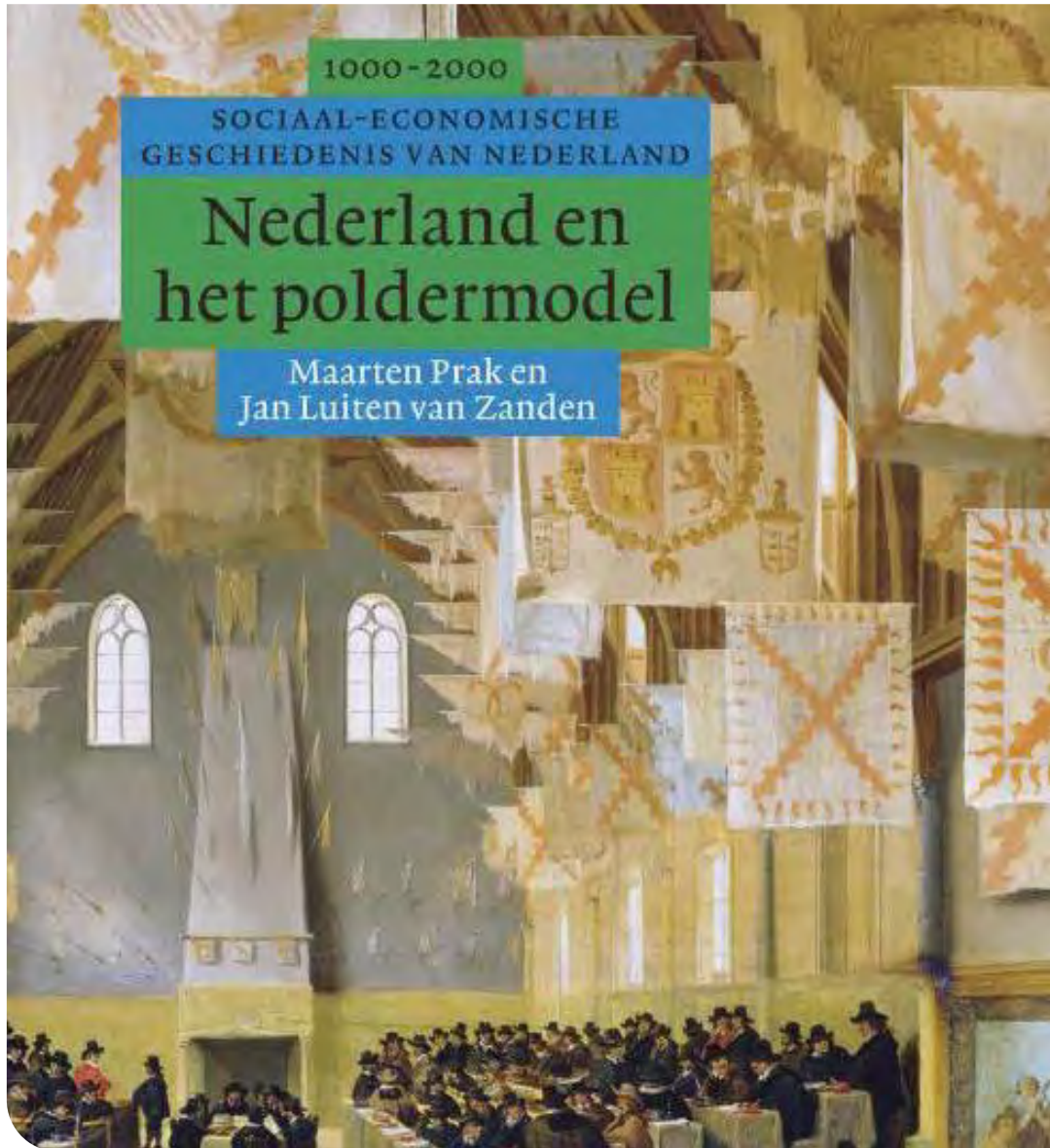
Peter Blicke  
Kommunalismus

### Kommunalismus?

- Gemeinde of independent farmers / craftsmen
- *Delegation von Unten*

# Ostrom's Design Principles Institutions for Collective Action

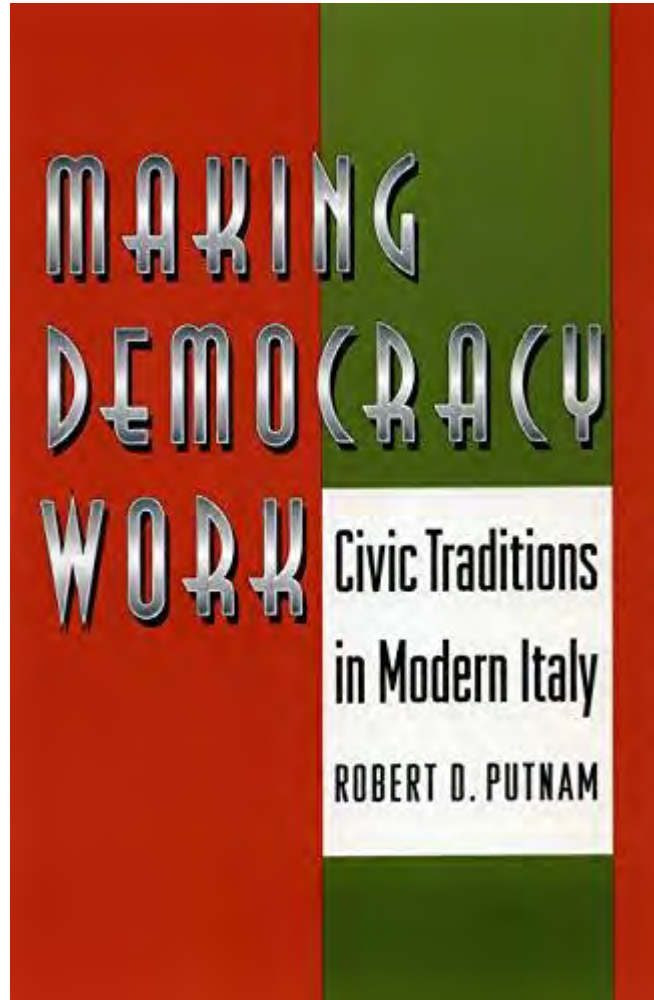
Design Principle	Description
1. Clearly defined boundaries	Membership involving rights to withdraw CPRs and physical boundaries of the resource(s) are clear
2. Congruence between appropriation and provision rules and local conditions	Rules are congruent with local conditions, including consideration of sustainable appropriation quotas
3. Collective choice arrangements	Individuals affected can participate in modifying operational rules
4. Monitoring	Monitors are accountable to the resource users
5. Graduated sanctions	Increasing sanctions apply for against repeat and/or serious rule violators
6. Conflict-resolution mechanisms	Ready access among resource users to low cost conflict resolution process
7. Recognition of rights to organize by external government authorities	Resource management institutions are recognised by government authorities
8. Nested enterprises	Governance activities are organized in multiple layers of nested enterprises for



## The Polder Model = symbol for society as a whole

- The Low Countries' model of Participatory Governance
  - Debate & Consensus
  - Economic growth
  - *“These civic organisations [from citizens over crafts to polders]... forced local and regional elites to engage with popular concerns. They did so willingly, because they felt that the alternative, i.e. princely rule, was even more unattractive...”*





## The Polder Model = symbol for society as a whole

- // Putnam's Civil Society:
- *Active civil society (participation in social life) produces generalized trust and economic growth*
- *social patterns plainly traceable from early medieval Italy to today turn out to be decisive in explaining why on the verge of the twenty first century some communities are better able than others to manage collective life and sustain effective institutions*

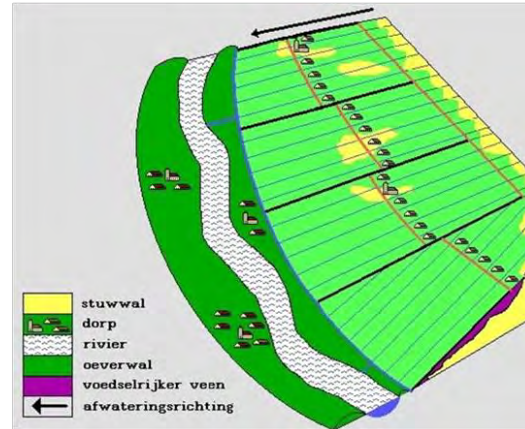
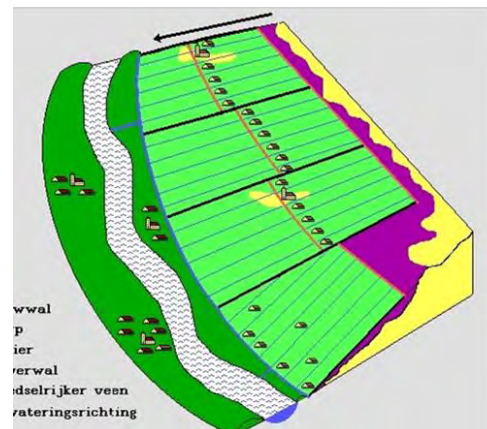
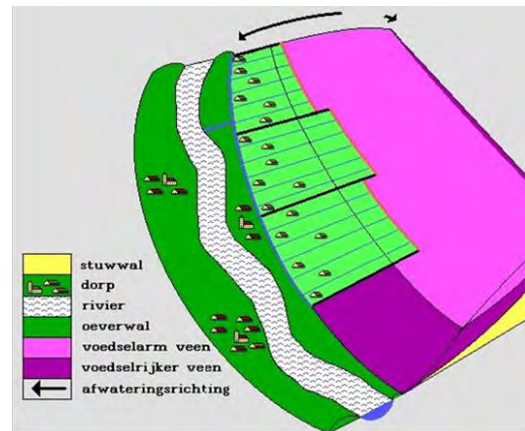
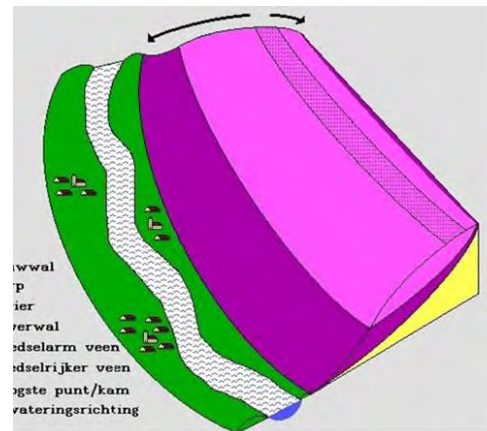
# Institutional Continuity But Social Change

- 15th-19th centuries: *increased hierarchisation*
- Very pronounced in Coastal Marshes:
  - Ex: size of Holdings 1328 versus 1569 near Furnes (Flanders)

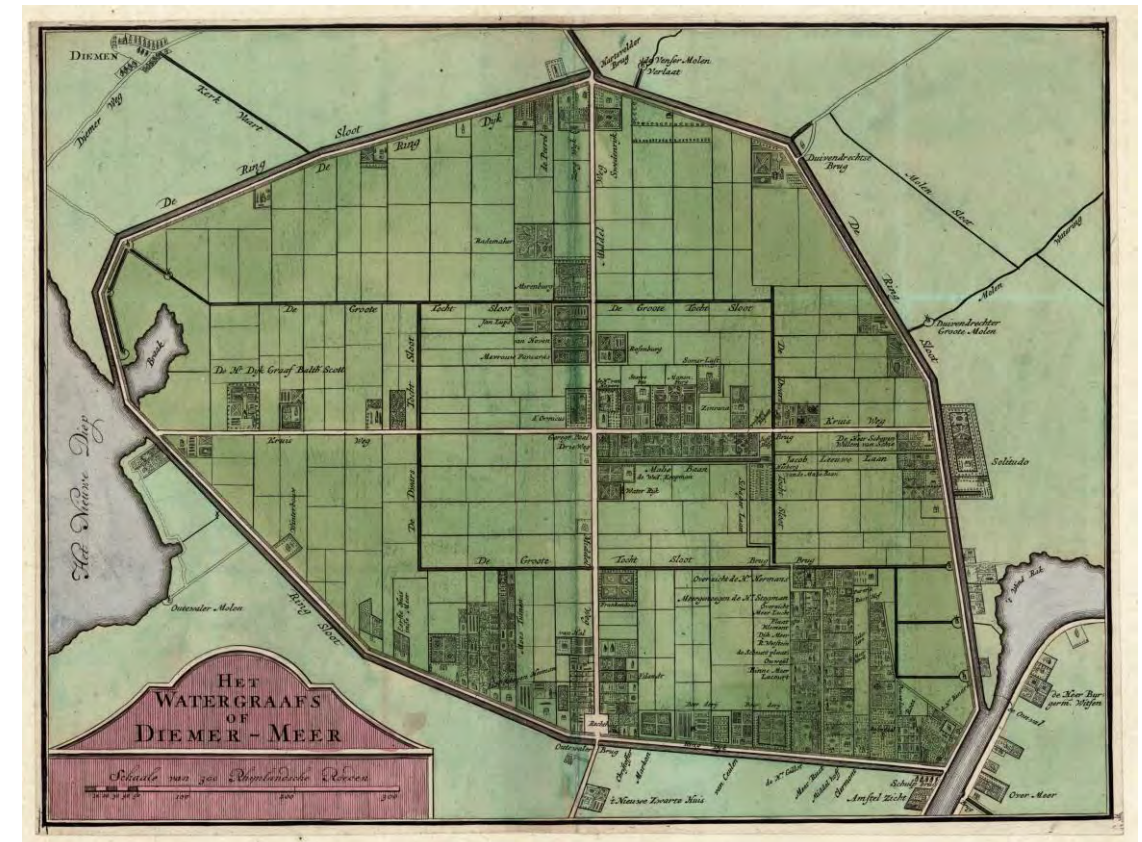
Parishes	Confiscations 1328 (Pirenne)		Holdings env. 1569 (Vandewalle)	
	Persons (N.)	Average landed property (ha)	Holdings (N.)	Average size (ha) (Median)
Bewester Poort	30	2,11	37	18
Adinkerke	76	1,06	65	13,66
Loo	28	2,64	72	11,3
Sainte-Walburge-Coxyde	43	0,92	37	13,76
Eggewaertscappele	17	5,32	30	17,85
Avecapelle	17	4,00	20	16,43
Bulscamp	31	0,44	51	11,81
Nieucapelle	12	2,20	45	16,58
Beoster Poort-sHeer Willen	28	2,27	30	18,5
Ramscapelle	16	1,72	54	19,97
Zoutenaey	3	0,22	6	15,68
Caeskerke	26	2,46	24	17,35
Pervyse et Sainte-Catherine	52	2,33	19	26,06
<b>Average</b>	29,15	<b>2,13</b>	37,69	<b>16,69</b>

# Institutional Continuity but Social Change

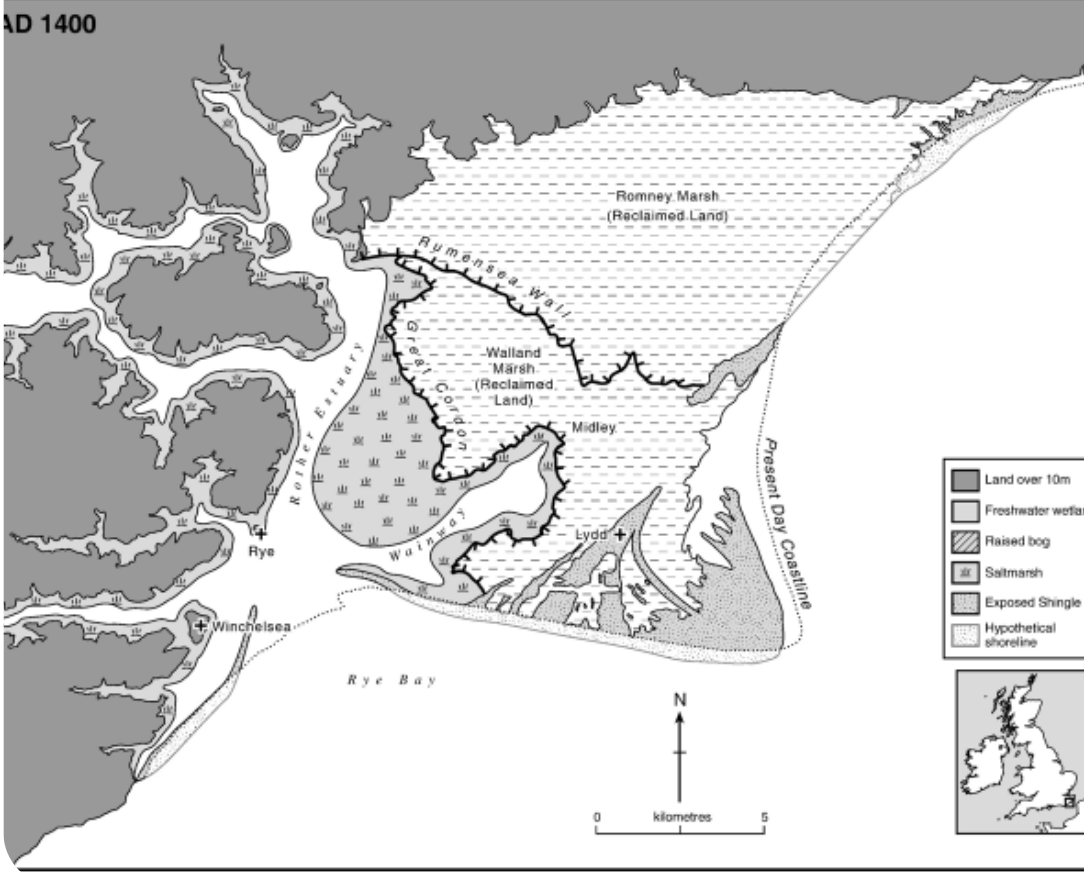
## Medieval Peat Reclamation (C. De Bont)



## Watergraafs of Diemermeer (Amsterdam)



# Romney Marsh (S – UK)





## Institutional Continuity, But Social Change

- Institutions persist as 'clubs' of large farmers
- (here: Geestmolen, Alkmaar c. 1900)

# Institutional Continuity, But Social Change



- Clear hierarchisation in the Early Modern Period
- But... something lingers on:
  - participation of *'ijder die slegts maar een tuijntje in eijgendom besit'*

# 2/3 Urban Water Commons

(with R. Janssens)

A N V E R P I A



PARS FLANDRAE



- |                       |                     |                     |                     |
|-----------------------|---------------------|---------------------|---------------------|
| 1. Oude Schiedt       | 7. Die Vrooye Stra  | 10. Die Kruyden     | 13. Die Kruyden     |
| 2. Die Nieuwe Schiedt | 8. Die Nieuwe Stra  | 11. Die Nieuwe Stra | 14. Die Nieuwe Stra |
| 3. Die Nieuwe Stra    | 9. Die Nieuwe Stra  | 12. Die Nieuwe Stra | 15. Die Nieuwe Stra |
| 4. Die Nieuwe Stra    | 10. Die Nieuwe Stra | 13. Die Nieuwe Stra | 16. Die Nieuwe Stra |
| 5. Die Nieuwe Stra    | 11. Die Nieuwe Stra | 14. Die Nieuwe Stra | 17. Die Nieuwe Stra |
| 6. Die Nieuwe Stra    | 12. Die Nieuwe Stra | 15. Die Nieuwe Stra | 18. Die Nieuwe Stra |

C. AN. VERET. nobilis in Brabantia oppidum, par  
 tum maritimum, Gallis, Germanis, Hispanis, Britannis  
 saepe frequentata, mercimoniis mirum in modum florere. Sump  
 tibus tam publicis, quam privatis edificij ultra nimirum  
 templum D. Iovinis templo, cum turri, et candido lapide al  
 tissima, (subter thauscauro, Anglicana, Portugalesijque domo  
 Monasterio Premonstratensium, monumento Isabellae Caroli  
 Ducis Burgundionum Coniugis, nobili. Anno a Christo  
 nato. C. L. D. LXVII. Die v. Novemb. munitissima  
 Anversipensium moenia, a Cronenburgo, usq. ad Ca  
 saream portam duobus, fossis, aequata fuere: et ab  
 vltimo cincta, fossa de aqua circumdata, quibus propriis



# Map by Christan s'Grooten c. 1570



# Bonaventure Peeters, the Wharf, 17<sup>th</sup> CE



# Antwerp 1570 – All Saints Flood

*(Source: Zurich Zentralbibliothek, R. Moser)*





## Surface Water (17th CE Van Caukercken)

# Passion Play, Gillis Mostaert, c. 1550 (detail: water well)



# Difference with Venetian-style Pozzo?



# Three differences:

*1. Technology*

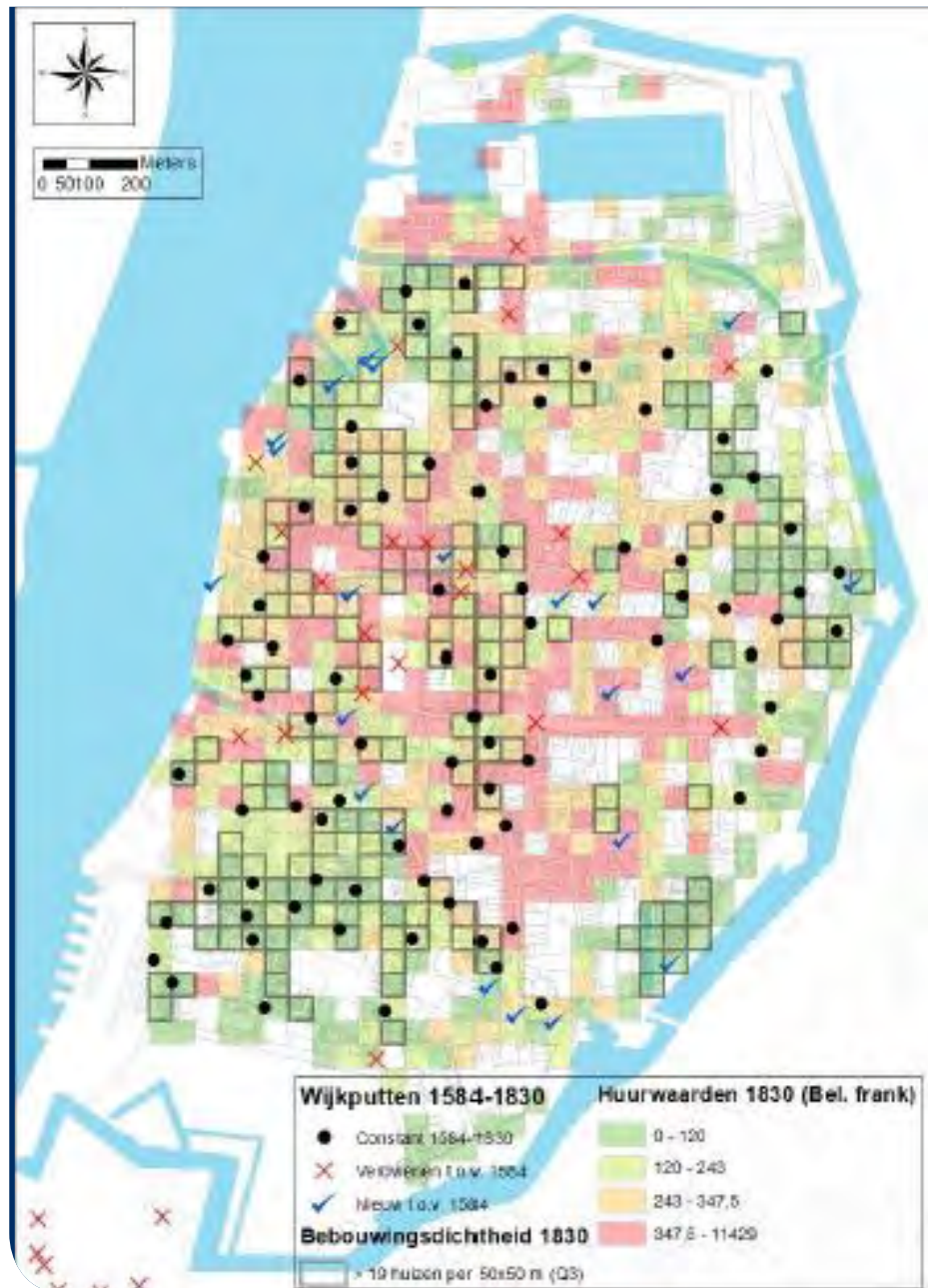
*2. Management*

*3. Health*









## c. 100 Neighbourhood Water Wells

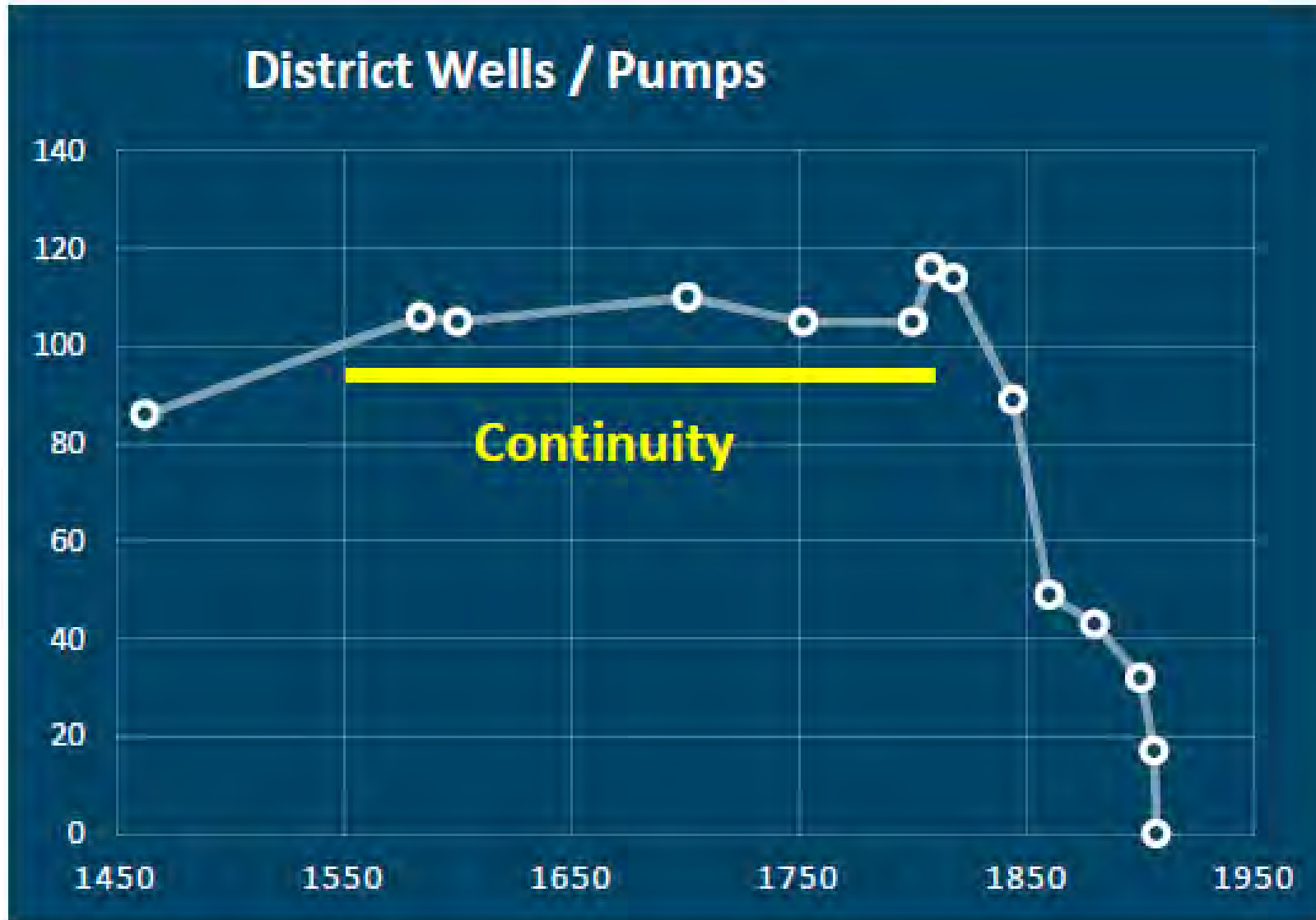
- ~demography
- (squares = most densely populated zones)

# Neighbourhood Wells

- By Quinten Matsijs c. 1490
- (originally in front of City Hall)
  
- Part of Urban Identity

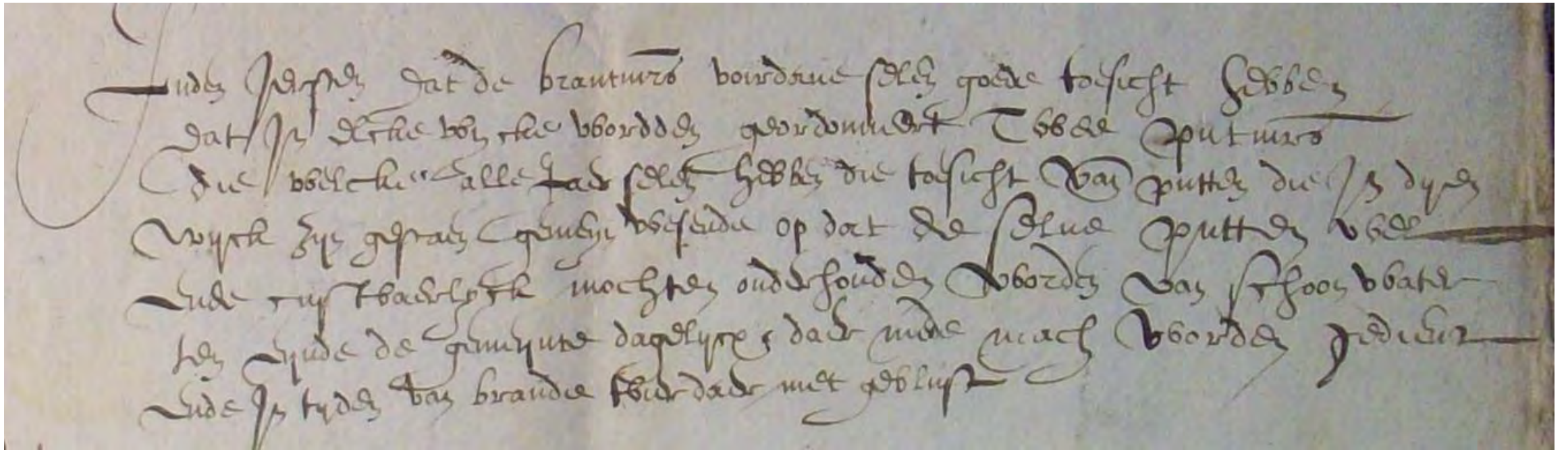


# Water Wells



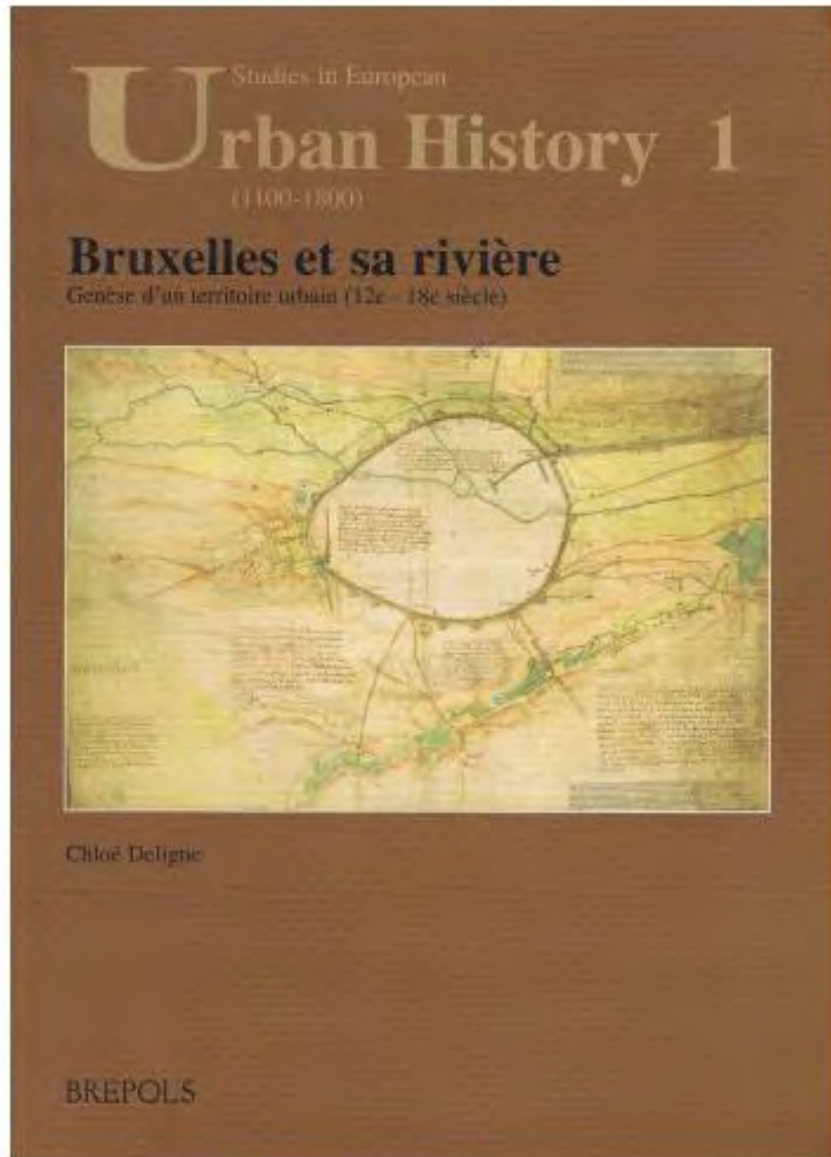
*Wijkputten of  
gemeyne  
putteborren  
(source: W. Van  
Craenenbroeck)*

*! Modern Piped  
Water = 1881 !*



## Organisation: Fire Ordinance 1581

- First, that all fire masters will supervise that in each quarter two well masters are ordained, who for the year will supervise the communal wells in their quarter, in order that these wells are maintained in a good and precious condition with clean water, allowing the community to use them on a daily basis and to extinguish the flames in times fire.



## Origins?

- Medieval Brussels: patrician families (identity markers)
- 15th century > 21 “gemeyne putteborren”
- Control of ‘wijkmeester’

Professions of well masters in 1701 (categories)	
Baker and pastry baker	25
Barber	5
Book retailer	2
Brewer or distiller	4
Butcher or food retail	2
Carpenter or builder	8
Clothing retail and manufacturing	7
Dyer	3
Glass worker	3
Liberal profession	2
Merchant	5
Metal worker or retail	13
Tavern keeper	5
Wood worker	5
Other trades	12
No profession listed	71
Source: R. Janssens (forthcoming)	

# Well masters 1701

- 2 per quarter
- Originate in the ‘middle classes’

# Neighbourhood Well as 'right'

- (1632) wijkput Boerenkwartier *“Desen aengemerckt, Ende dat de supplianten quartier mede deel is vande stadt, Dat oick hen niet den behoorden geweygert te syn tgene de mede borgers der gansche stadt deur syn genietende, Soo bidden de supplianten dat myne heeren gelieven wil in faveur ende goede policie ter syden deser te consenteren dat op een vande bequaemste plaetsen **aldaer int publicq oft gemeyn sal worden gemaect** ende gestelt eenen wyckput tot **gelycken oncost vande supplianten ende consoorten daerontrent gehuyst ende geerft synde, gelyck in dusdanige gevallen elders altyt voor desen is gepractiseert sonder differentie van gewillige oft ongewillige dit doende r.***”
- => 'Common Wealth' / Bien Commun.

The image shows a handwritten ledger with columns of numbers and text. The text is in French and includes phrases like 'St. Quartier', 'dito L'apen', 'dito 1796', 'dito 1797', 'dito 1798', 'dito 1799', 'dito 1800', 'dito 1801', 'dito 1802', 'dito 1803', 'dito 1804', 'dito 1805', 'dito 1806', 'dito 1807', 'dito 1808', 'dito 1809', 'dito 1810', 'dito 1811', 'dito 1812', 'dito 1813', 'dito 1814', 'dito 1815', 'dito 1816', 'dito 1817', 'dito 1818', 'dito 1819', 'dito 1820'. The numbers are arranged in a grid-like format, likely representing tax amounts for different households or properties.

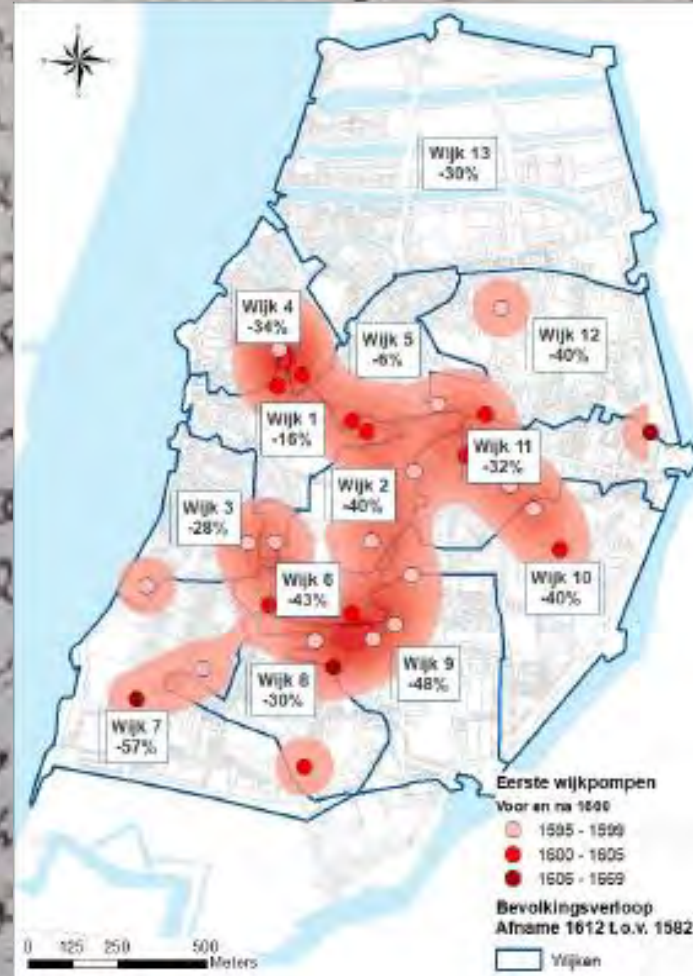
## Organisation: well-and-fire-tax

- Per neighbourhood
- Organised by the 'putmeesters' of each neighbourhood / gable width
- Exceptions for those with private water supply (increasingly in 18th CE)



# Health? Transition to pumps

For better *quality*:  
“... hoe dat dagelycx by  
dage als by nachte in  
seide wyckput, worden  
geworpen doode  
honden catten ende  
andere onreynheden,  
daernoctans  
gemeynlyck de goede  
lieden *daerontrent*  
*woonende dwater syn*  
*halende ende hunne*  
*spyse daermede*  
*moeten bereyden ...*”



# Health? Association with plague is not very strong

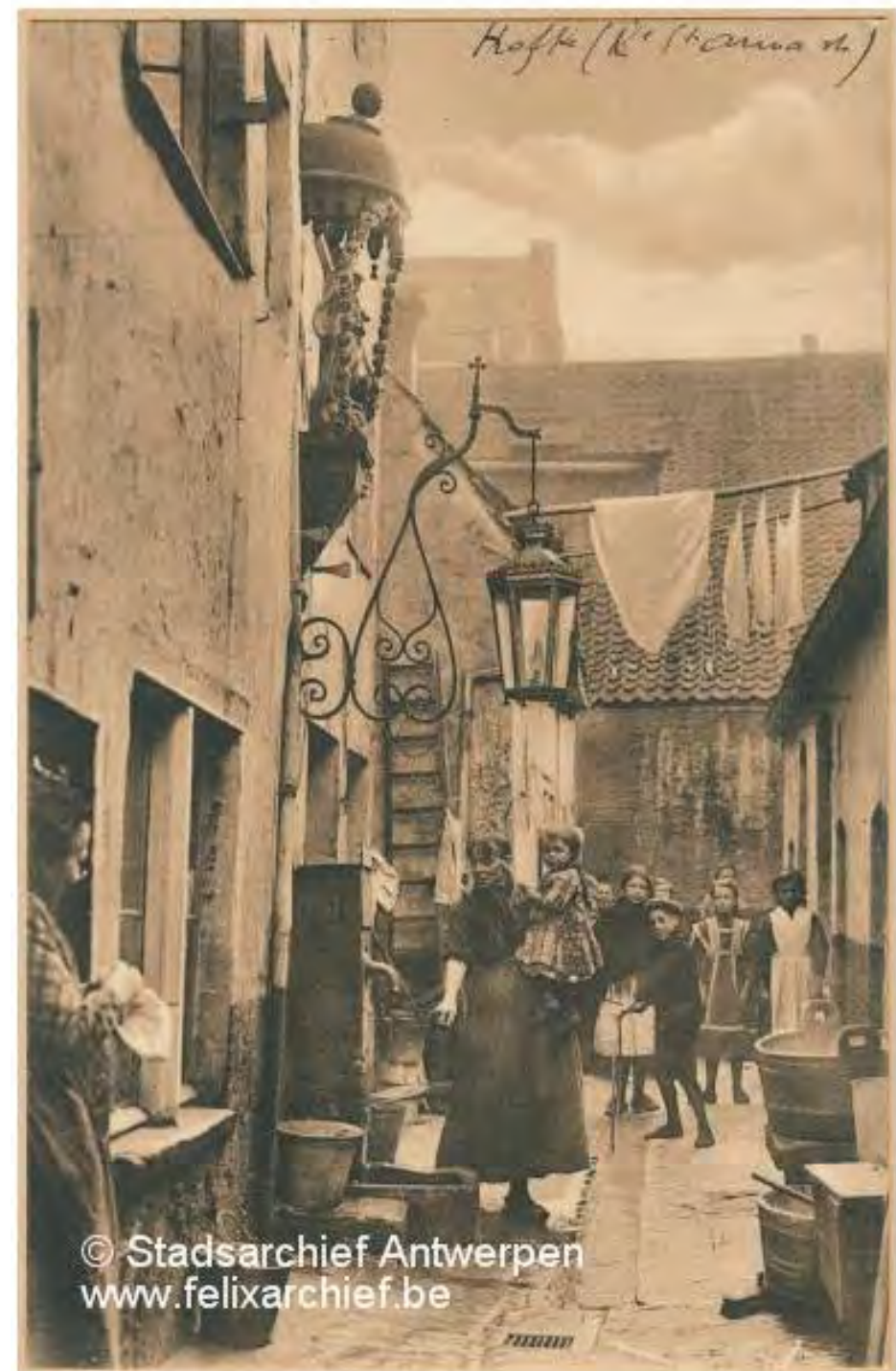
- EX. 1571: City imposes 100 £ fine on anyone who spreads plague by spreading filth (in water wells, in streets, on houses etc.)
  - *‘schrobbers oft schrobsters oft andere personen, die hun vervoorderen vuyligheden te worpen in de borneputten achter straeten, oft te streyken aen de deuren, poorten, borneput, ketenen, lenen, banken en elders aen de huysen der goede lieden, om daermede de besmettelyke siekte van de peste te verbreyden en voort te draegen, en de gansche stad daerdoor te bederven; niemand hem te bemoeyen met schrobben; de besmette huysen te reynigen*

# Alternatives for the wells

	Total Deeds	Groundwater well (%)	Rainwater “bakken” ('cisterns') (%)	Ground and/or rainwater pump (%)	Piped water (%)
1560s	485	26,2	16,5	1,9	0,2
1610s	276	<b>71,4</b>	<b>56,2</b>	<b>25,4</b>	<b>4,0</b>
1830s	304	11,2	24,0	28,9	0,0
1890s	523	22,8	12,0	24,5	5,0

# Other water supply systems

- Shared, semi-public, wells & pumps
  - *Korte Sint-Annastraat c. 1900*



# Other water supply systems

Sint-Juliaans-Hospitaal



Zwanegang



Copyright Stadsarchief Antwerpen (België)  
Zie: <http://stadsarchief.antwerpen.be>

# Antwerp 1553-54: Van Schoonbeke & his water company

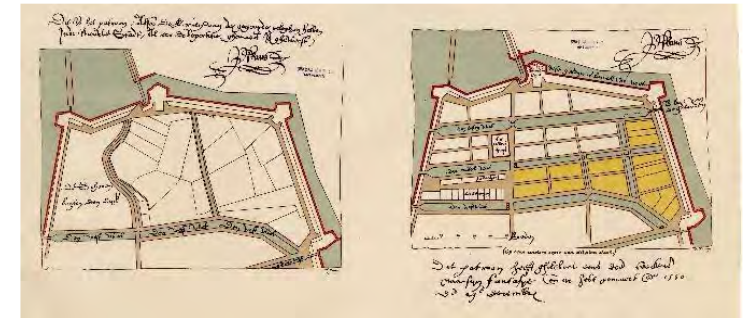
Driven by Horse Power



Noria from the underground reservoir

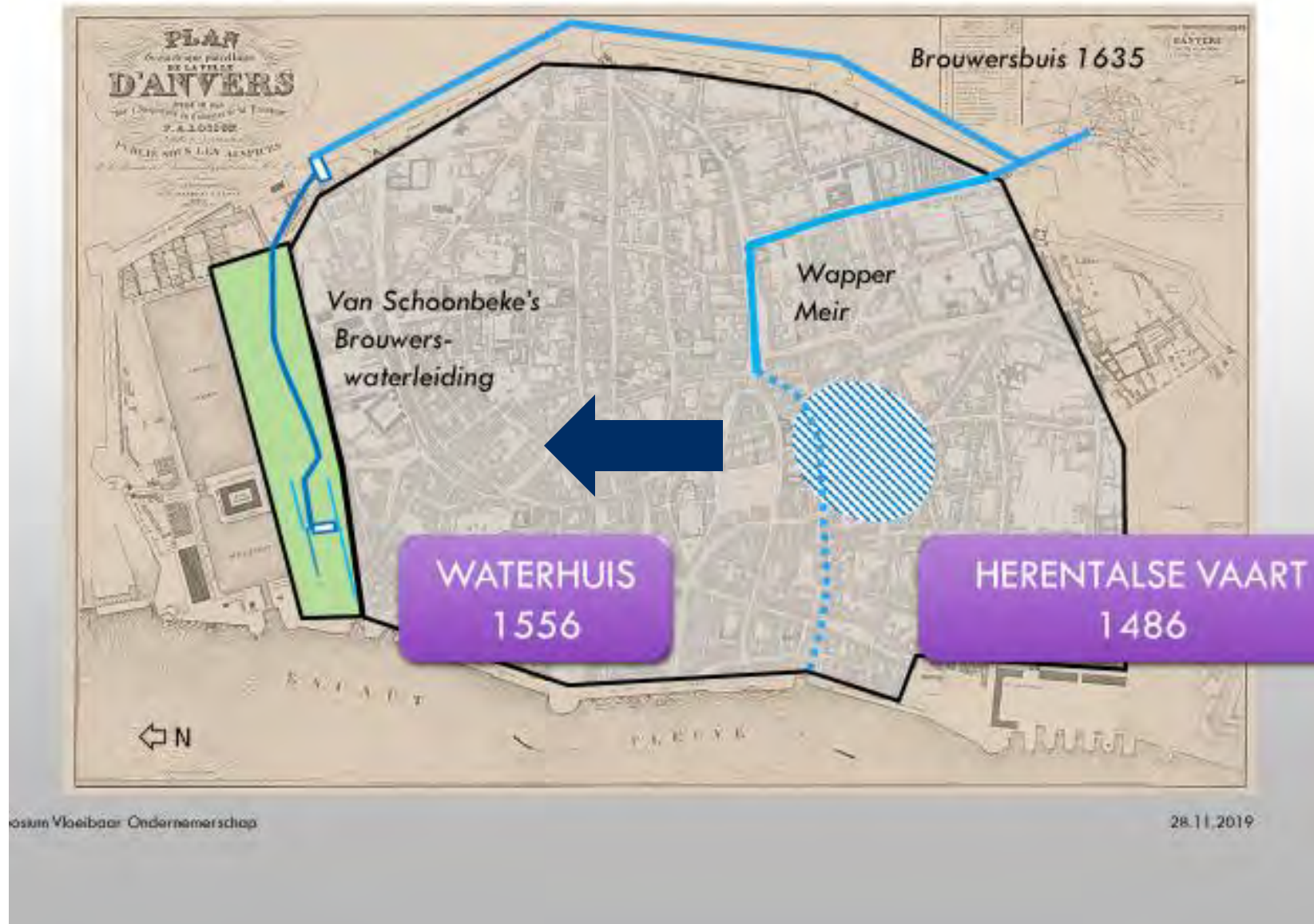


Supplying breweries



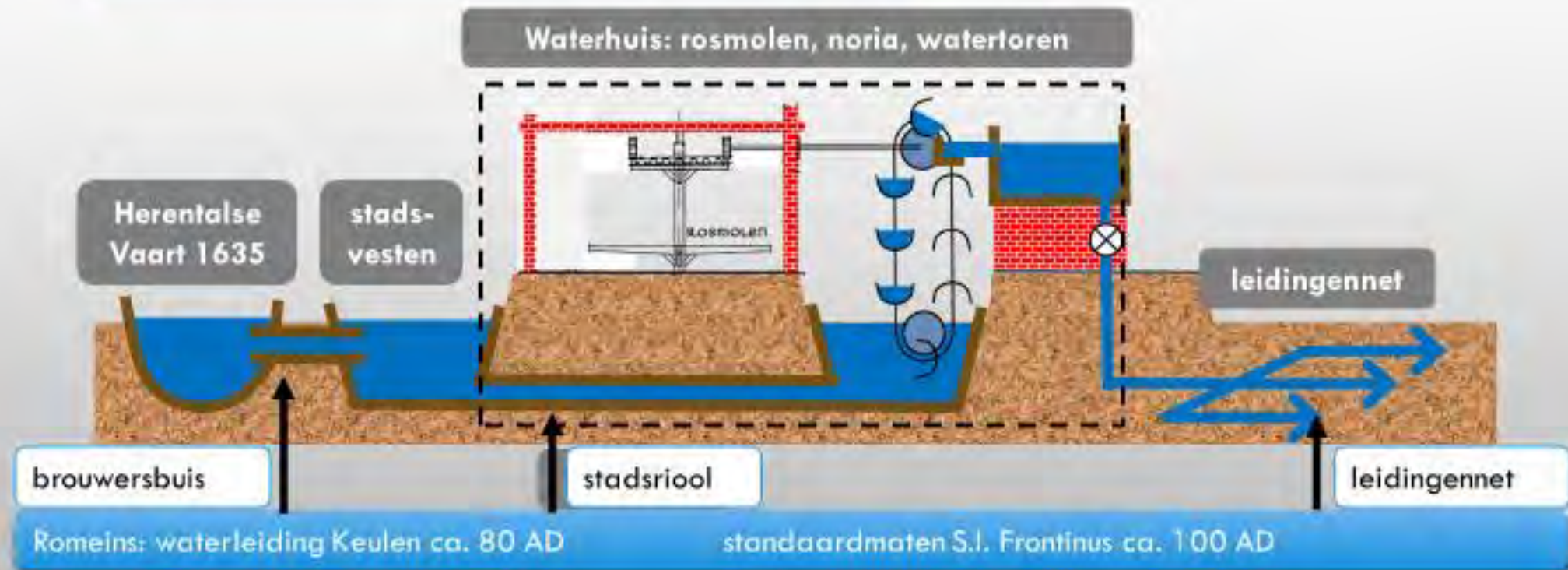
## 16<sup>th</sup> CE Water house

- Blaming 'insufficient' water quality
- Forcing brewers to relocate to new brewing district
- Step to **commodification**



# The 16th CE Waterhouse (W. Van Craenenbroeck)

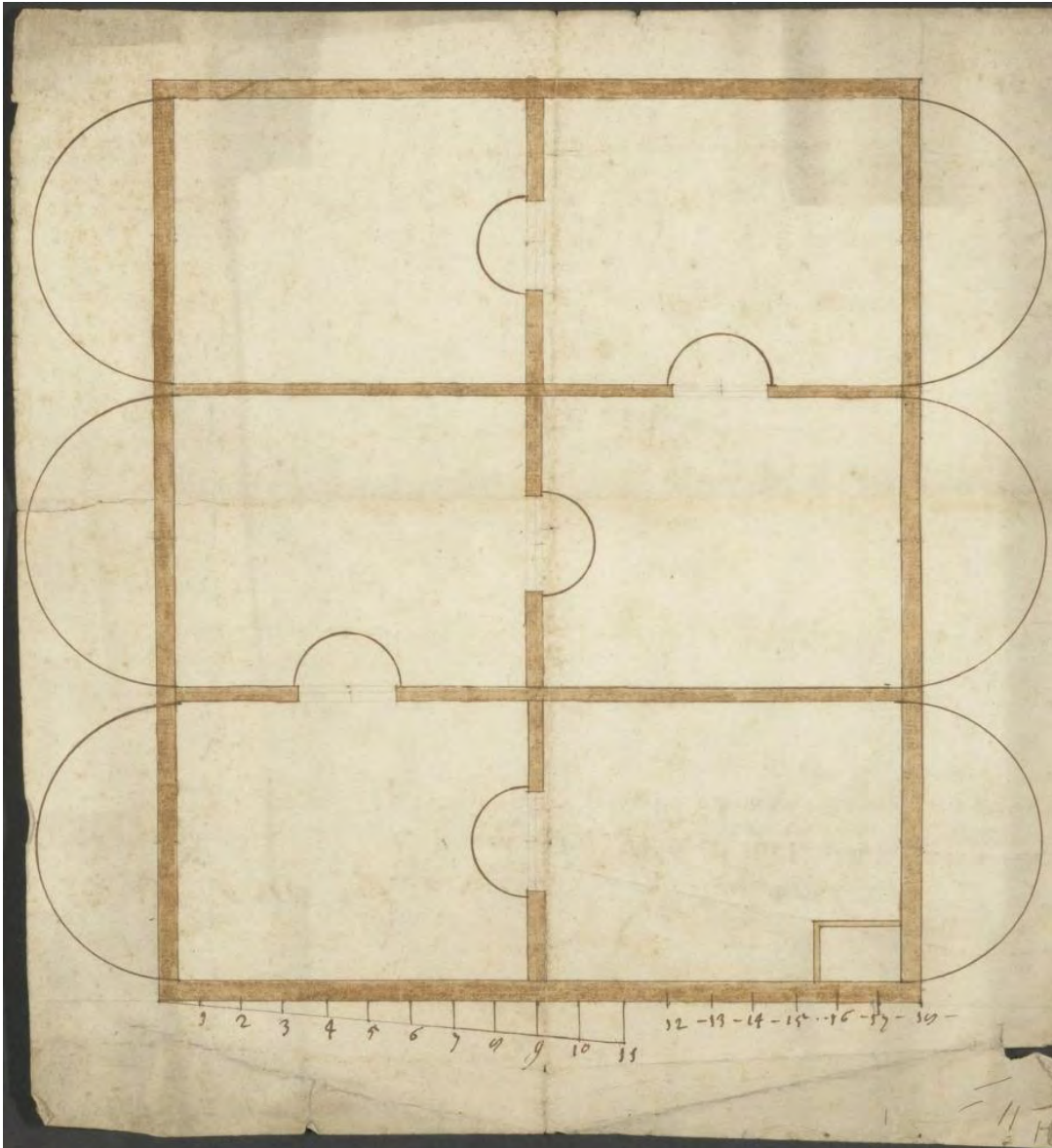
HET WATERHUIS: STATE OF THE ART?





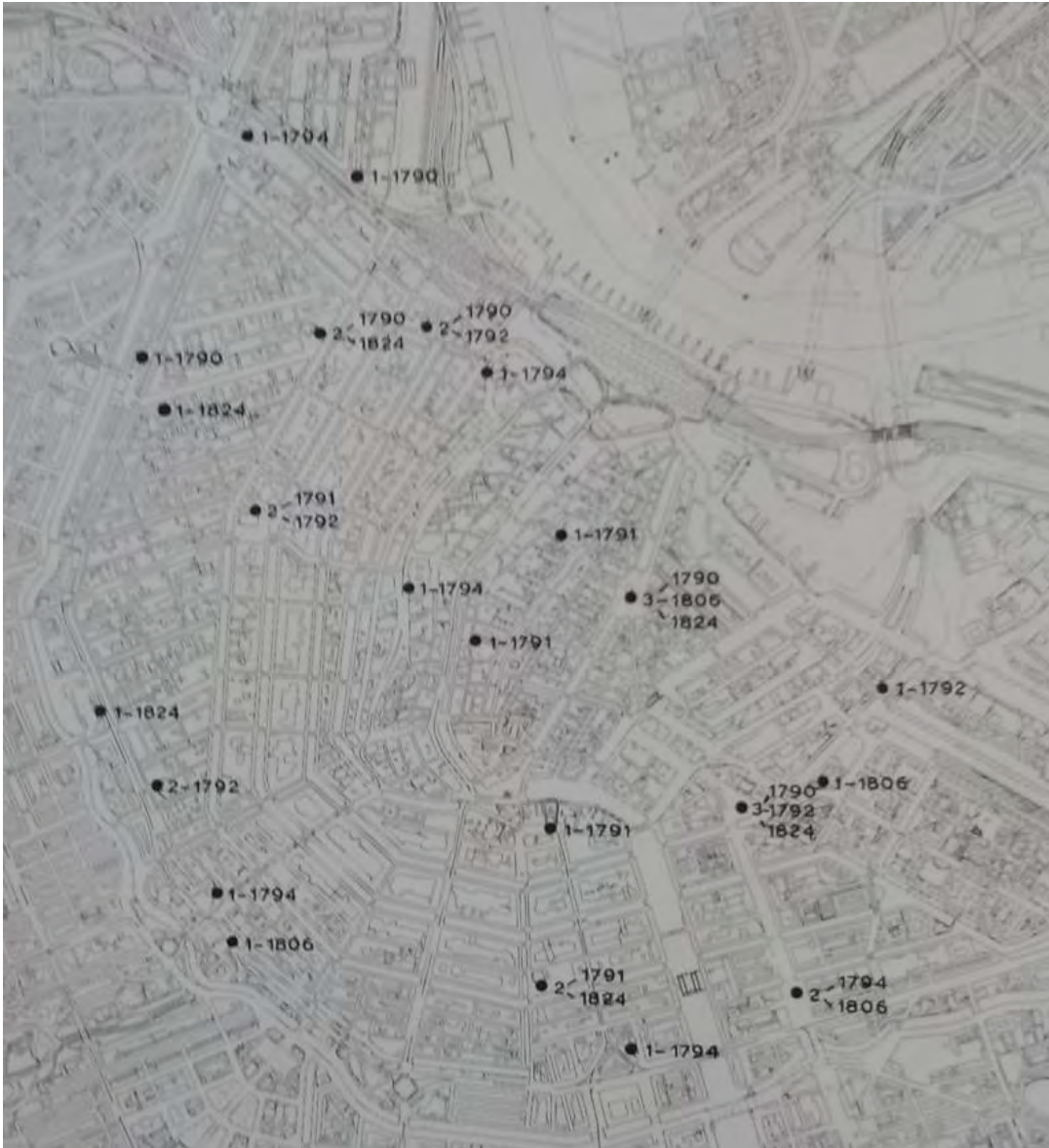
# Cisterns: see Amsterdam

- Amsterdam, Coping With Drought (P. Van Dam)
  - Ex: Burgerweeshuis Amsterdam, 1692:
  - 14 reservoirs = 3600 *ton* = 396000 liters



# Cisterns

- Amsterdam, Coping With Drought
  - Public ones from the 18th-19th century





## Cisterns

- Amsterdam, Coping With Drought
  - Public & Institutional ones: 125 in 1755 (= c. 2mio litres)
    - Part of which was *sold* (2 to 4 *duiten per bucket* (against 14 for 1 kilo rye bread).
  - Private ones, from 500 to over 10,000 litres (here: Nieuwezijds Voorburgwal 282, 3\*3,6\*3 (= c. 32400 liter)

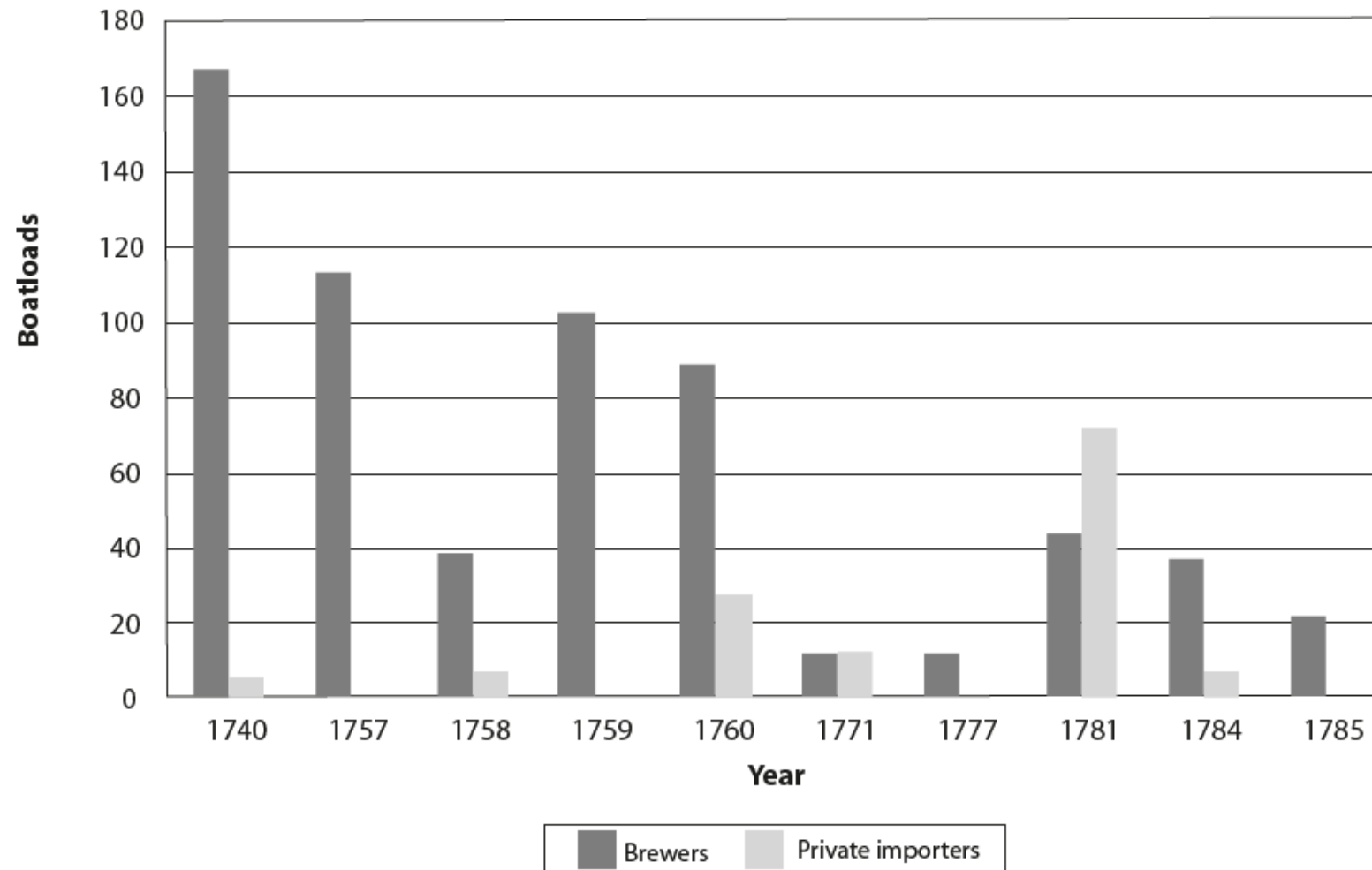
# Water Ships



- Water ship brings Vecht water to Amsterdam (1758)
- Source: Van Tielhof, 2022)

# Water ships

Figure 1 Boatloads of water brought into the city of Amsterdam by brewers and private importers during heavy winters



- Source: Van Roosbroeck 2019

# 3/3 Liquid Capabilities

# Two examples of participatory water cultures

- Those who benefit from water infrastructures, participate in their management.
- *Participatory water cultures provided **Hydraulic or Liquid Capabilities?***



# Capabilities

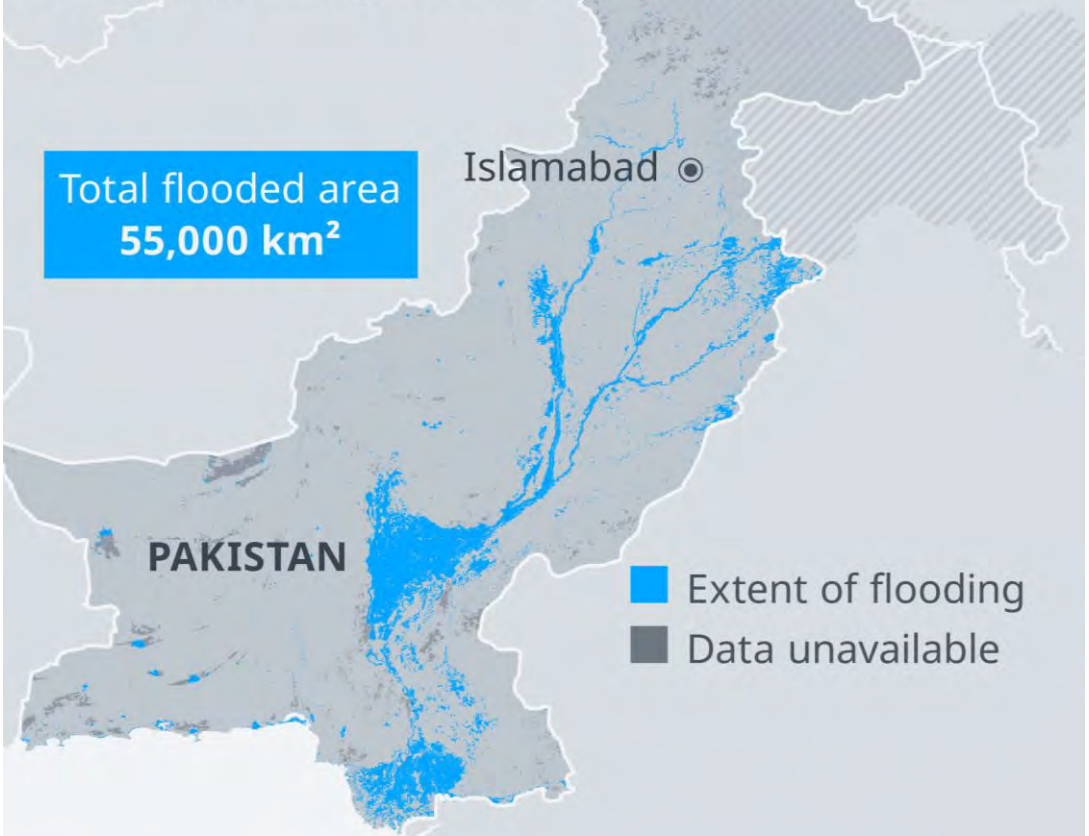
- *conditions or states of enablement that make it possible for people to achieve things*
- Not just 'equal opportunities' (Rawls), but also **minimal outcome:**
- *Martha Nussbaum: ten core capabilities*
  - *Bodily health: able to enjoy bodily health, including adequate nourishment and capacity for reproduction*
  - **Other species:** *being able to live with concern for and in relation to animals, plants and the world of nature*
  - **Environmental control:** *being able to engage with the processes and choices that affect our political and material lives*



# Pakistan Summer 22

## Heavy flooding in Pakistan

Extent of flooding based on satellite imaging



 Source: UNOSAT data collected between August 3-23, 2022.





## Belgium/Germany Summer 2021

### inundations en Europe



# Limited Liquid Capabilities





## Did participatory water cultures of the past do better?

- Elisabeth Altarpiece  
Remembering the 1421 flood  
(DORDRECHT c. 1500)



Jaerboek 24

de herten

de herten

de herten

almeide

de maat

de herten

de recht

de maas

dubbelvade

allen  
v. r.

allenhaer

strien

maelvaan



## WIKIPEDIA'S LIST OF DEADLY FLOODS

6	100,000+	<a href="#">St. Felix's Flood</a> , storm surge	<a href="#">Netherlands</a>	1530
9	50,000–80,000	<a href="#">St. Lucia's flood</a> , storm surge	<a href="#">Netherlands</a>	1287
10	60,000	<a href="#">North Sea flood</a> , storm surge	<a href="#">Netherlands</a>	1212
12	36,000	<a href="#">St. Marcellus flood</a> , storm surge	<a href="#">Netherlands</a>	1219
17	17,000	<a href="#">All Saints' Flood</a> , storm surge	<a href="#">Netherlands</a>	1570
24	several thousands	<a href="#">North Sea flood</a> , storm surge	<a href="#">Netherlands</a>	1014
25	several thousands	<a href="#">St. Juliane flood</a> , storm surge	<a href="#">Netherlands</a>	1164
26	several thousands	<a href="#">St. Agatha flood</a> , storm surge	<a href="#">Netherlands</a>	1288
27	several thousands	<a href="#">St. Clement flood</a> , storm surge	<a href="#">Netherlands</a>	1334
29	several thousands	<a href="#">All Saints flood</a> , storm surge	<a href="#">Netherlands</a>	1532
30	several thousands	<a href="#">North Sea flood</a> , storm surge	<a href="#">Netherlands</a>	1703
48	2,400	<a href="#">North Sea flood</a> , storm surge	<a href="#">Netherlands</a>	838
66	1,558	<a href="#">St. Martin flood</a> , storm surge	<a href="#">Netherlands</a>	1686
84	800	<a href="#">North Sea flood</a> , storm surge	<a href="#">Netherlands</a>	1825
20	10,000–100,000	<a href="#">St. Elizabeth flood</a> , storm surge	<a href="#">Netherlands</a> , <a href="#">Belgium</a>	1421
15	25,000–40,000	<a href="#">St. Marcellus flood</a> / <a href="#">Grote Mandrenke</a> , storm tide	<a href="#">Netherlands</a> , <a href="#">Germany</a> , <a href="#">Denmark</a>	1362
19	14,000	<a href="#">Christmas flood</a> , storm surge	<a href="#">Netherlands</a> , <a href="#">Germany</a> , <a href="#">Denmark</a>	171733
52	2,142	<a href="#">North Sea flood of 1953</a> storm surge	<a href="#">Netherlands</a> , <a href="#">United Kingdom</a> , <a href="#">Belgium</a>	1953

But... only from late 16th CE deadly flood disasters

# Deadly Flood Disasters in the Low Countries

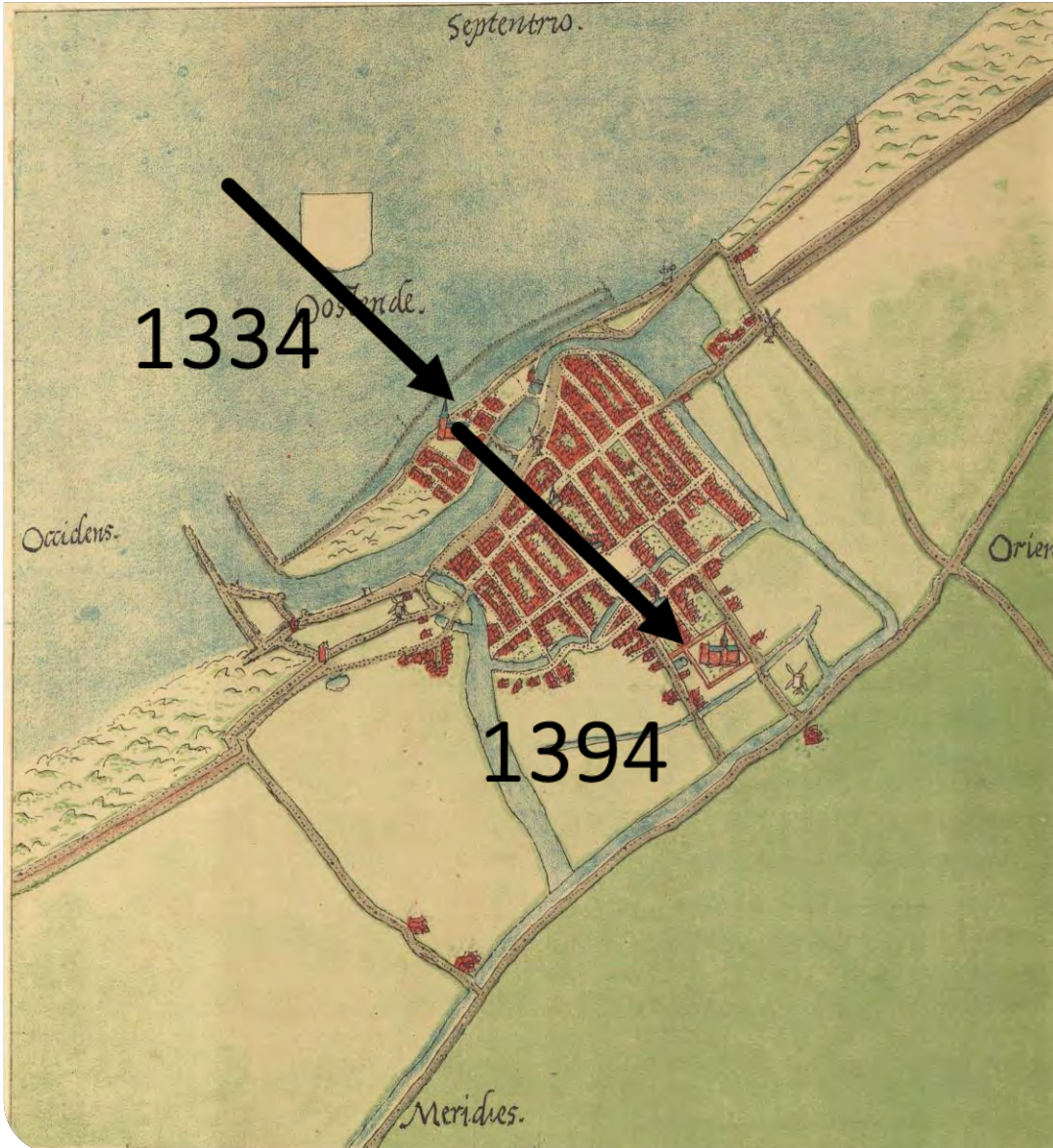
*(Source: Buisman)*

Year	1570	1717	1686	1953	1825	1682
Victims	6,000 ??	2,426	c. 1,900	1,836	c. 380	< 100



# Agency: relocating settlements (here: Ijzendijke, Flanders 1404 > 1440)





## Agency: relocating Settlements

- Ostend, Belgium: 2x relocated in the 14th century

# But: participatory models discredited

- **Example 1 Ossenisse (Flanders) 1288-1292**
  - 1288: big flood and dike breach
  - Count of Flanders: *'terras quasdam ad nos ob defectum dicationis secundum legem patrie devolutas'*
  - 1289-: granted to Cistercian Abbey Our Lady of the Dunes
  - Expropriation of 135 peasants (c. 500 ha), *not capable of reembankment*



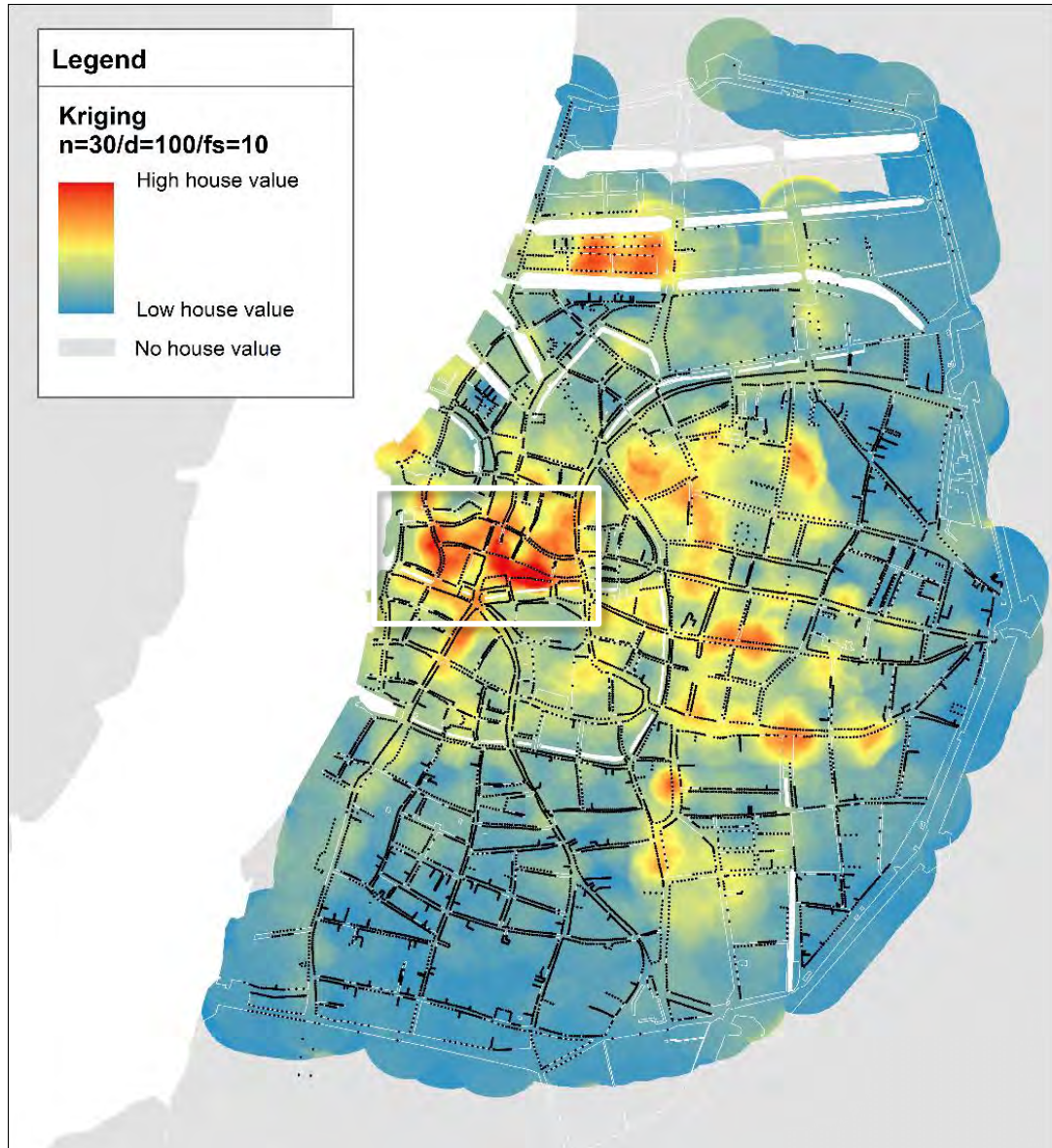


## But: participatory models discredited

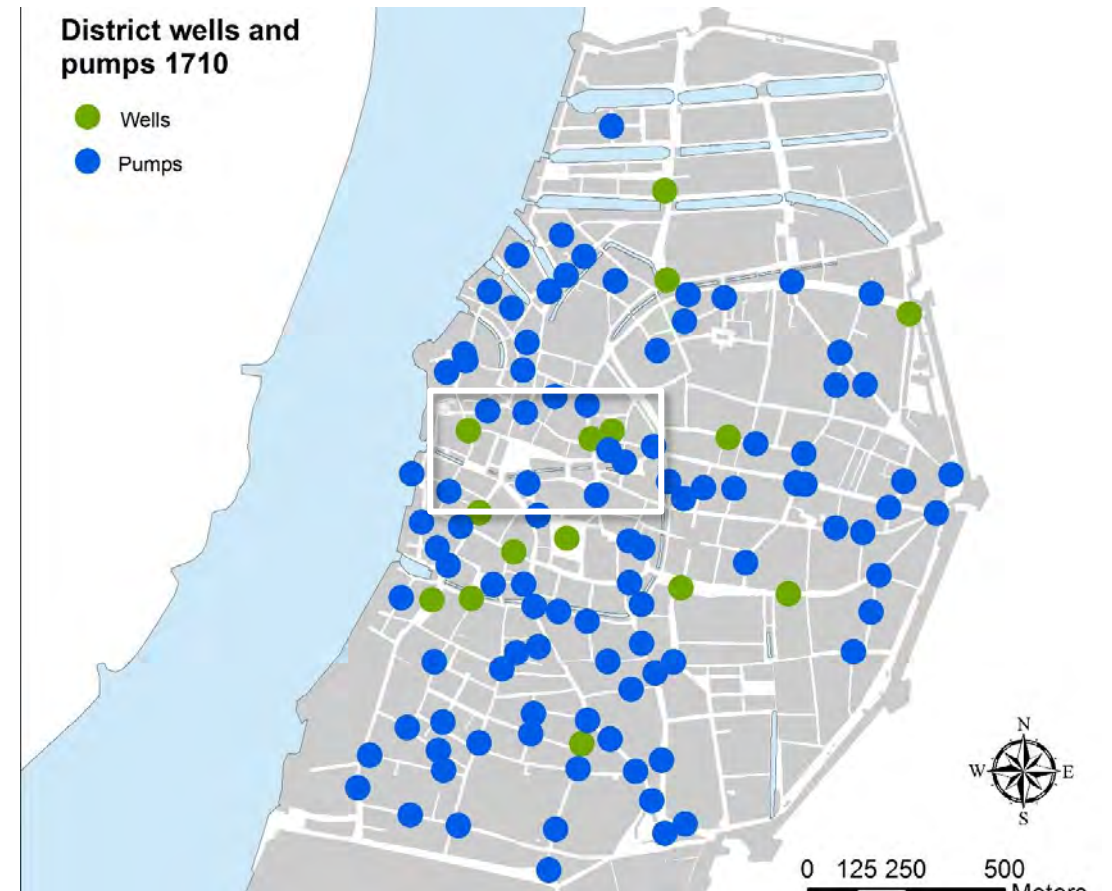
- Ex. 2, Frisia 1570:
  - Habsburg governor *Caspar de Robles* :“Take your privileges and put them on the dike. If they can protect the land from the sea, you can keep them. If not, you will pay”

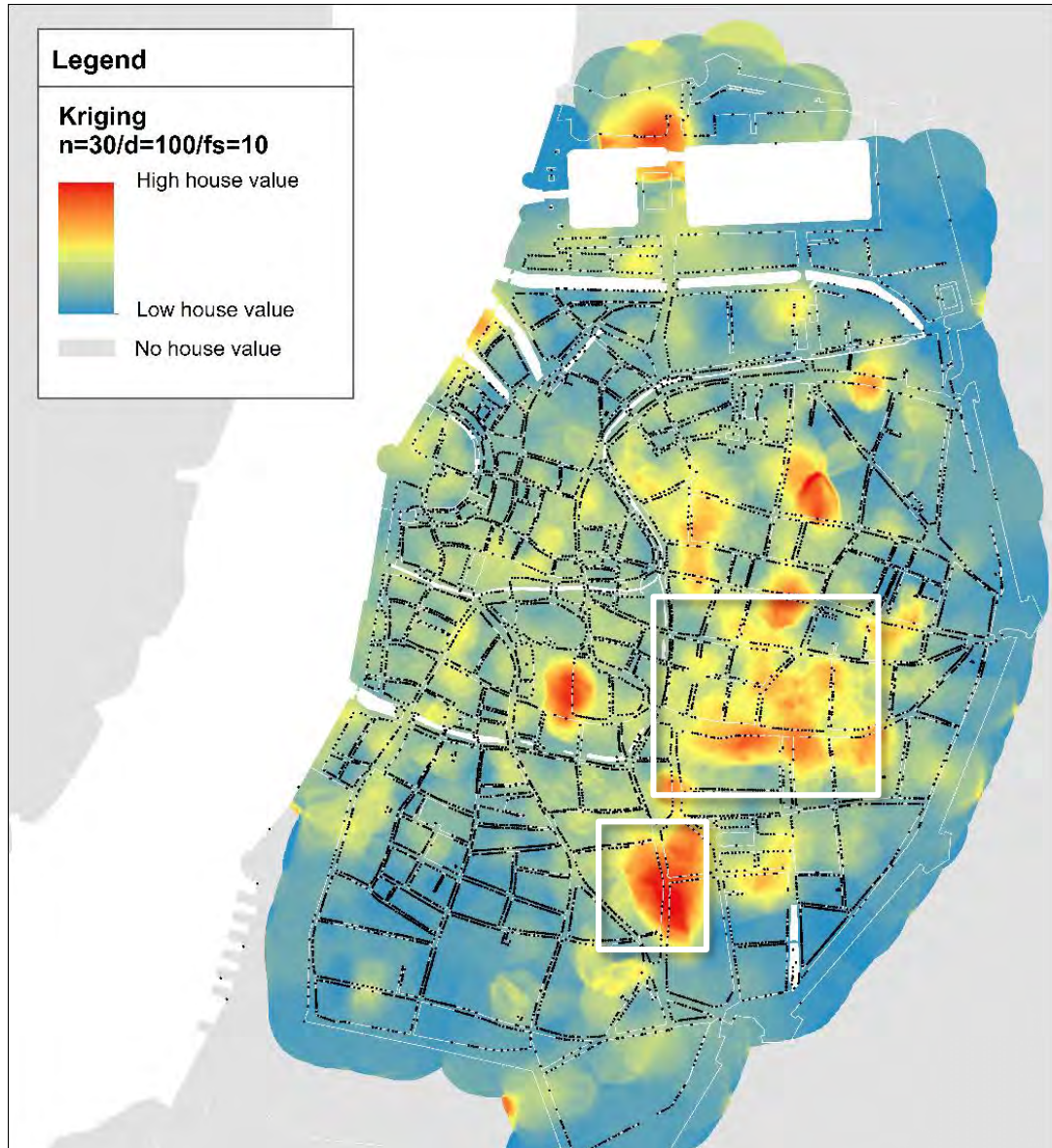


**Water wells:**  
*same erosion of capabilities*



# 16th-17th CE: also in rich neighborhoods





**1830-50:**  
**rich houses 'opt out'**





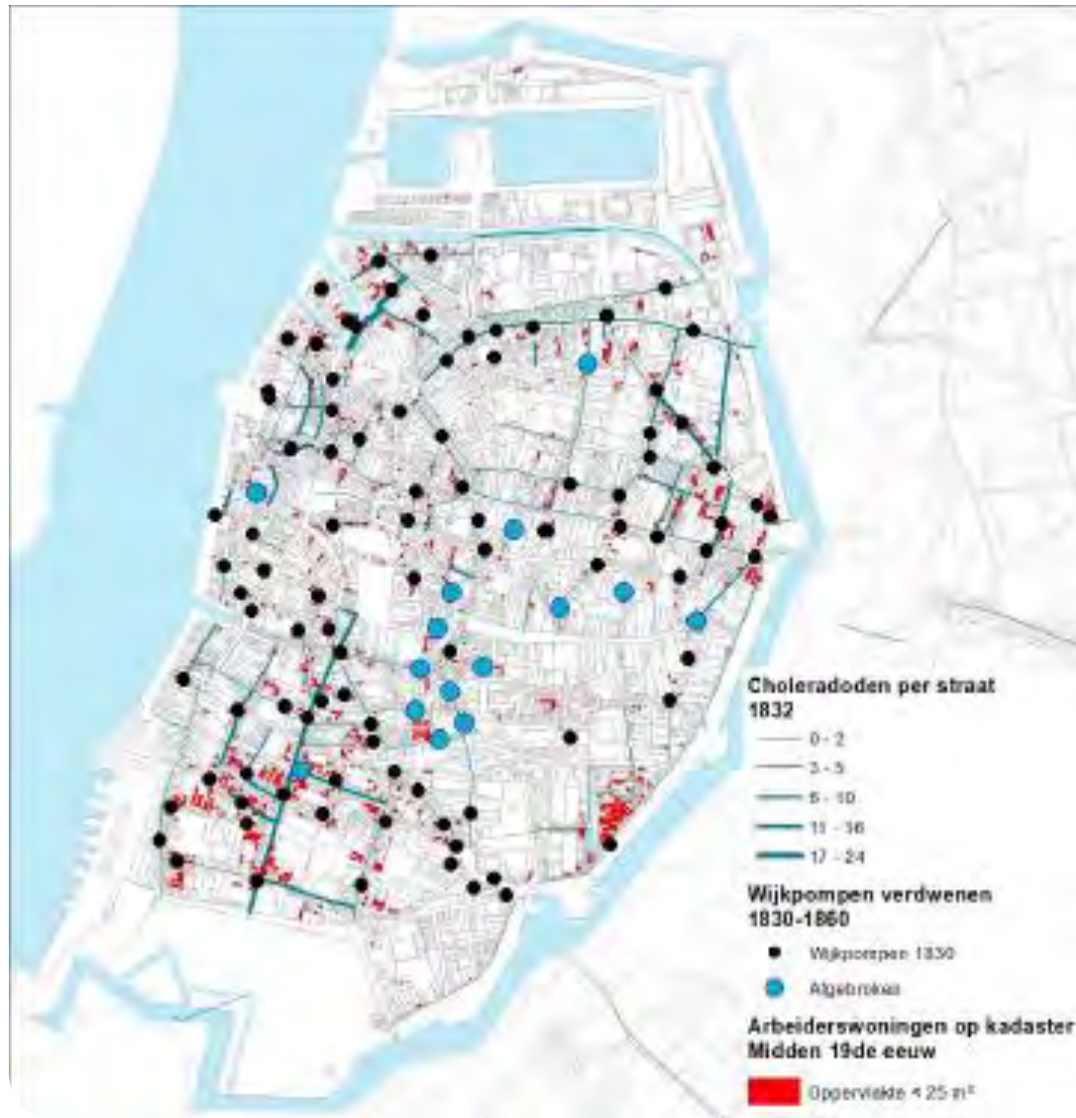
## Water wells: 19th century erosion

- “The city architect, who has been consulted by the board of mayor and aldermen, expressed the opinion that the building project would be an embellishment for the Marché aux Oeufs, since the public road would be cleared of an ugly corner; [...] **Your commission believes that [the] neighbours have no property rights on this pump. [...]** Even if the general utility of the pump would be demonstrated; it **could be examined whether utility should not be sacrificed at times for the pleasant; [...]** Furthermore we can be positive that the **utility that results from the current state of affairs for the 2 neighbours, will be counterbalanced by the pleasantness that will result for the entire neighbourhood.**”



# Enter the Cholera

- Rich Neighbourhoods: opt out
- Cholera 1866:
  - 2961 deaths (/117000)
  - *perceived* as limited to
  - working class neighbourhoods
  - filthy open water
  - Neighbourhood wells



Plan indiquant par une teinte noire  
les maisons où le Choléra a sévi pendant

l'épidémie de 1866.

1<sup>re</sup> Feuille.

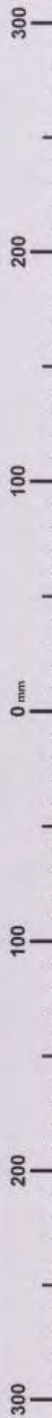
Dressé par l'ingénieur de la Ville chargé,  
Anvers, le 22 Janvier 1867.

*M. Van der Vliet*



ESCAUT

FLEUVE.



Van Beveren:  
cholera  
victims of  
1866



**Hypothesis: as long as people are  
*capable* of organizing their water  
=> no major disasters**

# Participatory water cultures > Liquid Capabilities?

- *Participatory water cultures provided **Hydraulic or Liquid Capabilities?***
  - ***Not always***
  - ***Provided they are socially inclusive***
  - ***Provided they are tolerated by the state / outside actors***