

# Ship channels, flood risk and deltas: NL and Houston, a reflection

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*October 13, 2022*



# 150 years of “Nieu Waterweg”

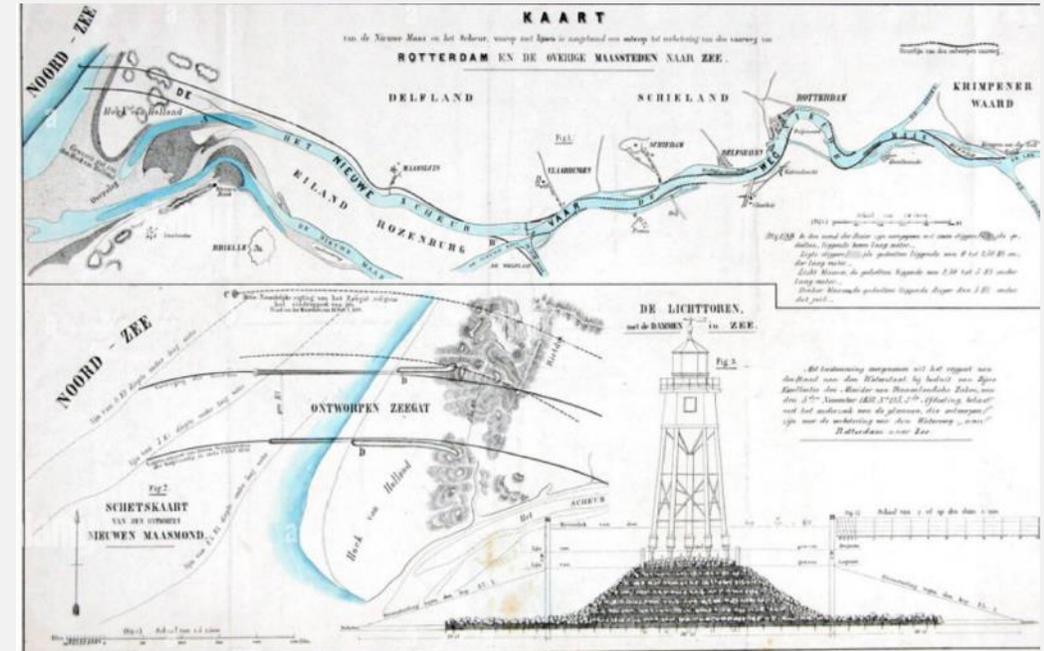
WATERWEG van ROTTERDAM naar ZEE.



Shot Julius Perger  
Sjage

Lichtopstand op den Noordelijken Dam aan den Hoek van Holland, op 2000 Meter in Zee.

1876.



# Plan B / Backup plan required?

In face of rising sea levels the Netherlands 'must consider controlled withdrawal'



RUTGER  
BREGMAN

'DIT MAG JE  
NIET MISSEN'  
Helge van Leur

HET  
WATER  
KOMT

This is the Dutch story – where the climate crisis threatens the very existence of the country itself.

# Rotterdam region – flood risk

- Current strategy: dikes + barrier
- Reliability of current Maeslant barrier is “just sufficient” (1/100 per demand)
- Closure frequency will increase
- Flooding frequency of unembanked area will increase
- Options: upgraded or new barrier, dam, dike reinforcements Rdam area, .....









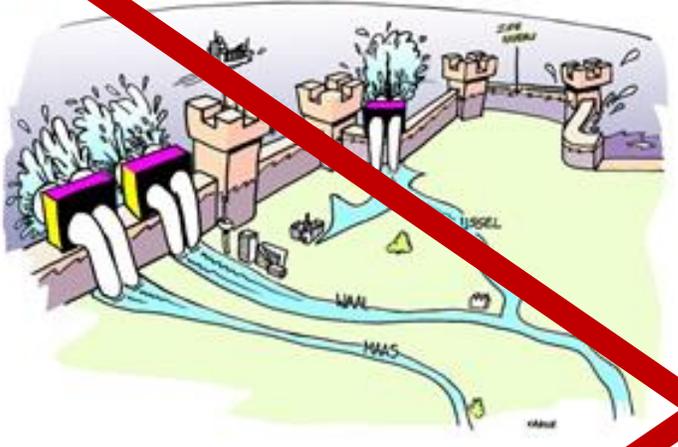
# Hollandkering: stronger together



*Ties  
Rijcken,  
Koen  
Meijman,  
TU Delft,  
RHDHV,  
et al.*

# Move from: four “cartoon” strategies for NL

Protection (closed)



Protection (open)



Seaward expansion



Accommodate



# To: regional strategies

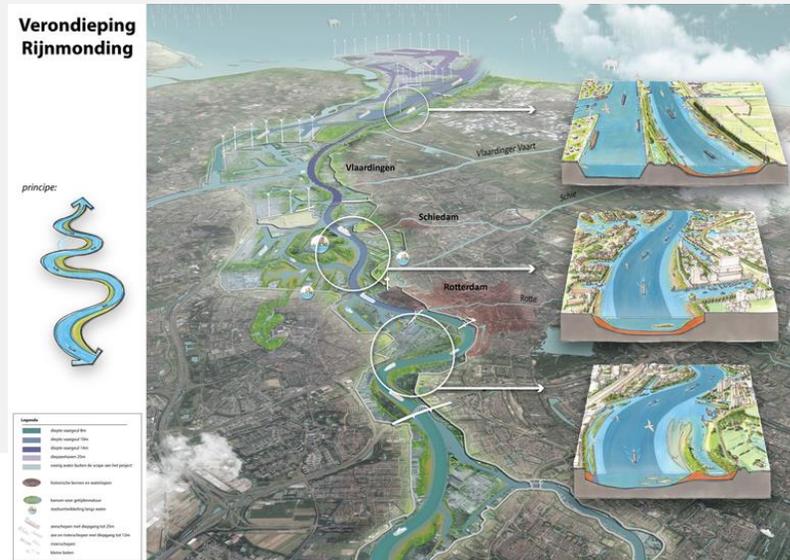
## Open but protected



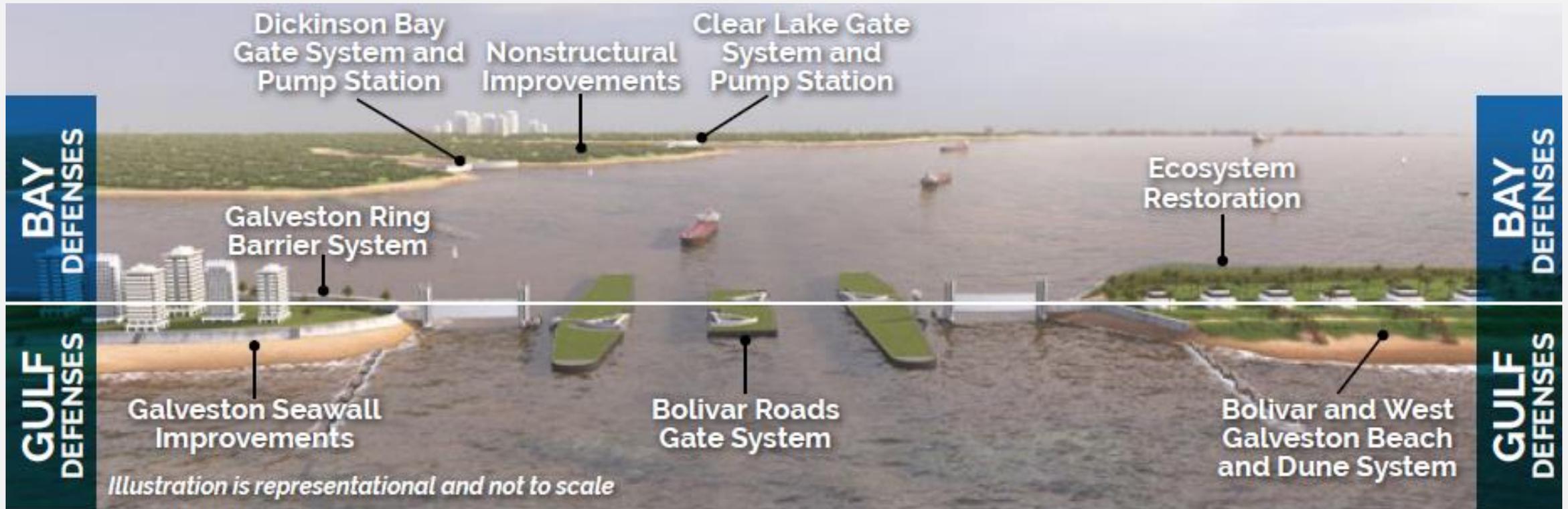
## Closed



## Open and natural



# Houston – Galveston Bay



- Reduce flood risk
- Limit ecosystem impacts
- No hindrance for shipping
- Etc.

Delta Design 2.0!

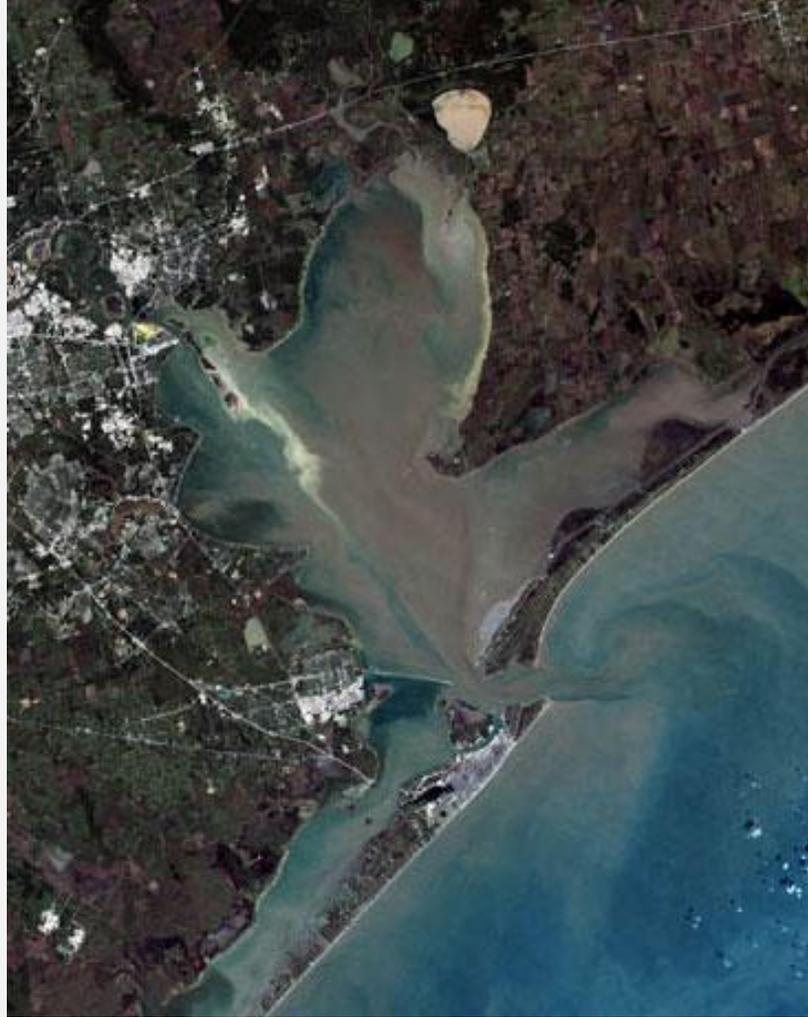
# Houston Ship Channel

**Seatrade  
Maritime News**

**Houston begins \$1.1bn ship channel  
widening**



# Challenges / broader transitions



# Different perspectives

- “International cross road of global nature”
- “economic enabler and powerhouse”
- Historical narrative
- River and dredging sediment budget perspective

# Closing remarks

- Not just a ship channel or flood protection
- Opportunity to combine transitions
- Multidisciplinary perspective, social, technical, planning, ecological
- Need for research by design and analytics