



Rhine estuary closeable but open
- a multi-disciplinary exploration -

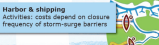
Problem
Increase of design water levels due to sea-level rise and higher river discharges.




The idea
Flood barriers around the densely populated areas of Rotterdam and Dordrecht that close during high water levels.



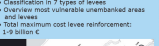
Harbor & shipping
Activities: costs depend on closure frequency of storm-surge barriers




Effect water levels:
• 30-50 cm decrease in design water levels
• Rotterdam: failure possibility storm-surge barriers crucial



Urbanism & multi-functional levees
• Classification in 7 types of levees
• Urbanism most vulnerable unbarriaded areas and levees
• Total maximum cost level reinforcement: 1-9 billion €



Multi-functional movable barriers
• Combination of functions
• Flexible, sustainable and even displaceable
• Investment costs: 850 M€



THE CONCEPT

