



ICFM6

6TH INTERNATIONAL
CONFERENCE ON
FLOOD MANAGEMENT

September 16 to 18, 2014 - São Paulo - Brazil

ADAPTATION MEASURES AND PATHWAYS FOR FLOOD RISK IN DORDRECHT

BERRY GERSONIUS
UNESCO-IHE / DORDRECHT



Context: Delta Programme

- In the Netherlands, the central government, water boards, provinces and municipalities are working together on a new Delta Plan on Flood Risk Management. This is the implementation element of the Dutch Delta Programme and it comprises a cohesive set of measures for specific regions, like the Rhine Estuary-Drechtsteden;
- The Delta Plan programmes measures for the short term (2028), but also looks ahead to the medium term (2050). This phased approach was driven by major uncertainties around future developments and the desirability of responsible financial investment;



UNESCO-IHE
Institute for Water Education

NWO
Netherlands Organisation
for Scientific Research



-  Rhine Estuary-Drechtsteden
-  Southwest Delta
-  IJsselmeer region
-  Rivers
-  Coast
-  Wadden region



Adaptive Delta Management

- The Delta Programme uses the Adaptive Delta Management (ADM) approach.
- ADM encourages an integrated approach to tasking and minimises the regret with respect to maladaptation, which results from e.g. over- or underinvestment in flood risk management. Key points are:
 - Linking short-term decisions with long-term tasking;
 - Incorporating flexibility in possible adaptation strategies;
 - Working with multiple strategies that can be alternated between;
 - Linking different investment agendas.



Step 1: Short-term

- Description of the current strategy, together with the reasoning process (ambitions, objectives and direction of action);
- Translation of ambitions and objectives related to the current strategy into short-term tasking;
- Identification of the measures that could contribute to meeting the short-term tasking.



UNESCO-IHE
Institute for Water Education

NWO
Netherlands Organisation
for Scientific Research



Step 2: Medium-term

- Clarification of the key uncertainties from future developments influencing the tasking, such as climate and socio-economic change;
- Definition of the metrics that describe the future developments;
- Modelling different future developments to provide insight into the occurrence of Adaptation Tipping Points (ATP), where the current strategy will no longer be able to meet its objectives;
- Development of the reasoning process related to the new strategy
- Identification of alternative measures that might postpone ATP and assessment of the efficiency for the different scenarios;
- Identification of the opportunities for mainstreaming adaptation with other planned investments in the area, such as urban renewal.



Step 3: Long-term

- Design of multiple Adaptation Pathways (AP) based on the efficiency of the individual measures. AP show the timing of implementation of measures and the points at which decision should be made on the selection of potential options. AP also generate insight into lock-ins and possible options that are still open. Opportunities for mainstreaming adaptation may be considered to adjust timing of implementation of measures;
- In addition, it is necessary to identify critical values (triggers) beyond which adjustments in the strategy will need to be made.



Step 4: Linking short-term to long-term

- Identification of anticipative actions that are necessary in the short term to enable the AP. This comprises the initiation of:
 - Potential adjustments in legislation, rules and procedures;
 - Innovation and research;
 - Spatial reservations;
 - Securing of funds.

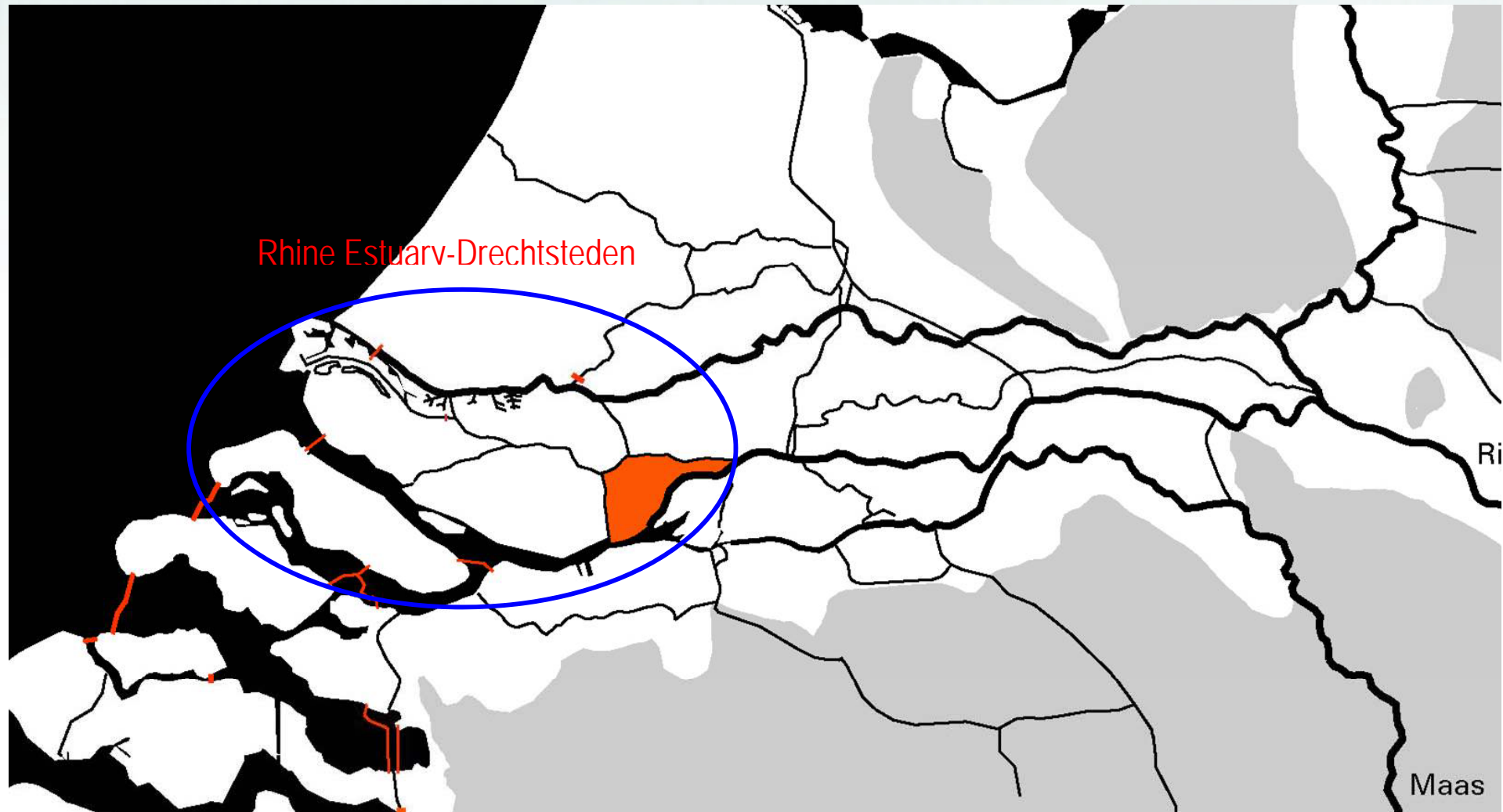


UNESCO-IHE
Institute for Water Education

NWO
Netherlands Organisation
for Scientific Research

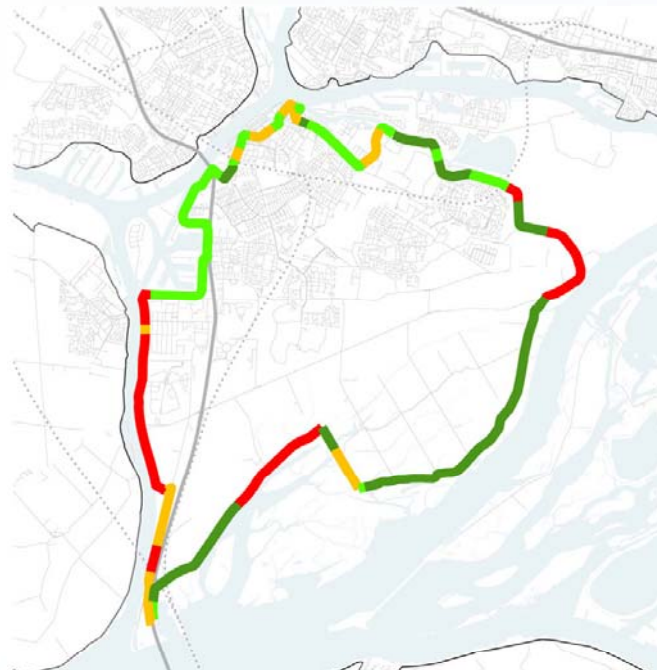


Case study: Dordrecht



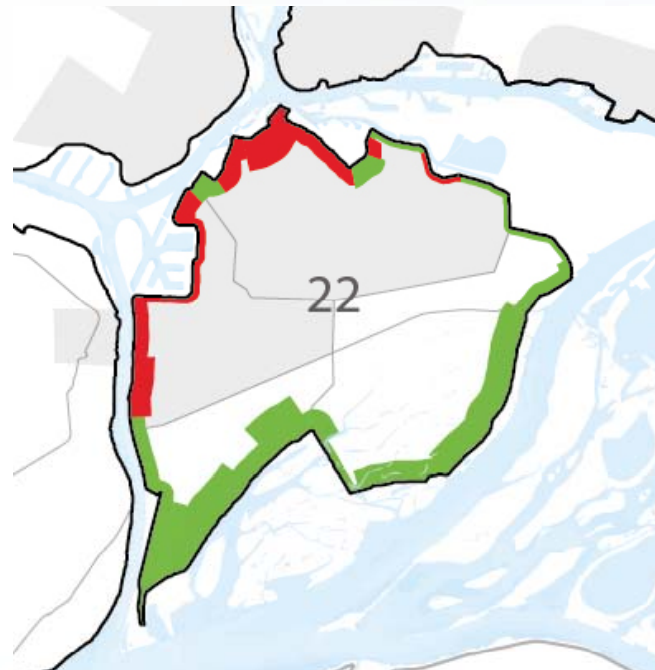
Step 1: Short-term

- The current strategy involves dike improvements and replacing the storm surge barriers;
- Short-term tasking has been inventoried in the 2nd and 3rd Statutory Assessments, based on the safety standard (1/2,000 per year).



Step 2: Medium-term

- Future tasking follows from external factors (sea level rise, shifts in river discharges) and internal influences (updated standard);
- Given the considerable tasking and spatial effects, the question arises as to whether there needs to be a shift in strategy.



Excess or deficient height

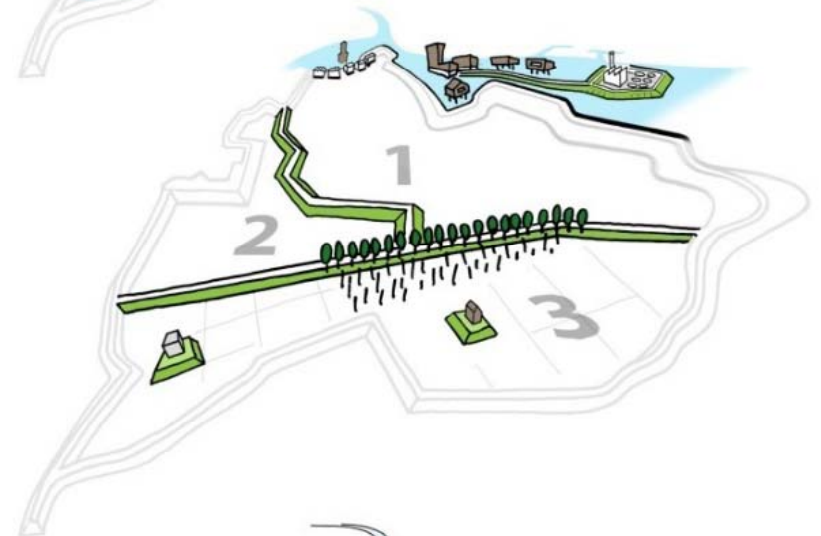


Dike along the Voorstraat



Step 2: Medium-term

- An alternative strategy has been developed that addresses the 3 layers of Multi-Layered Safety:
 1. Protection through dikes;
 2. Spatial planning;
 3. Emergency management.
- Measures in layer 2 and 3 are combined with protection measures to meet the updated standard.

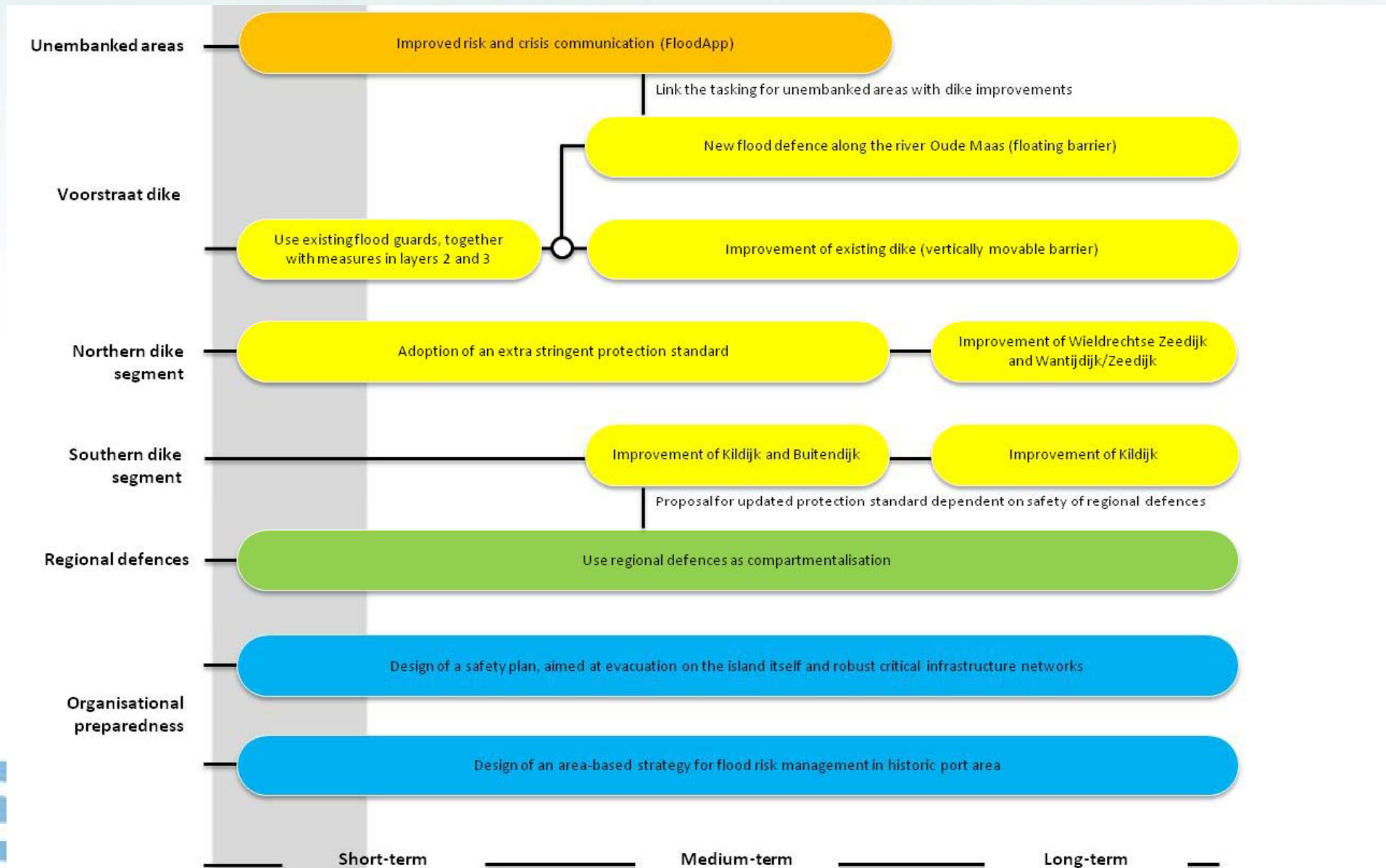


Step 2: Medium-term

- As part of the strategy development, opportunities for mainstreaming adaptation have been identified:
 - An alternative to dike improvement of the Voorstraat is to build a floating barrier in the quays of the historic port area. This will provide synergistic benefits by protecting the historic port area.
 - The water board has made an extra investment in safety with the improvement of northeastern dike segment. This excess safety allows for the adoption of a more stringent standard, without increasing the future tasking.
 - Green adaptation measures could be implemented to address the future tasking, such as the maintenance of forelands.



Step 3: Long-term



Step 4: Linking short-term to long-term

- If the safety level is going to be based in part on measures in layers 2 and 3, then it is essential to guarantee that they will actually provide the necessary safety;
- The regional partners and central government have initiated a MIRT study into the added value of and the possibilities for safeguarding measures in layer 2 and 3;
- The MIRT study will also look for a better connection between flood risk management and spatial planning and further develop the opportunities for mainstreaming adaptation.



Conclusions

- The ADM approach has been successful in assessing the robustness and flexibility of the current strategy for Dordrecht. A strategy is robust if it addresses the tasking arising from a range of scenarios. A strategy is flexible if it is relatively easy to accelerate or defer measures or to switch between strategies.
- The Multi-Layered Safety strategy for Dordrecht ensures that the objectives and safety standards are met in a timely and efficient manner, that opportunities for mainstreaming adaptation are taken advantage of, and that unnecessary costs of potentially irreversible measures are avoided.



Acknowledgements and relevant literature

- EU's Interreg IVB project CAMINO
- NWO/WOTRO project Dynamic Deltas
- Bloemen, P., 2013: Beslissingen in DP 2014 en DP 2015: Onderscheidende kenmerken voorkeursstrategieën, Memo voor Programmadirecteuren Overleg
- Haasnoot, M., Middelkoop, H., Van Beek, E. and Van Deursen, W., 2011: A method to develop sustainable water management strategies for an uncertain future. *Sustainable Development*, 19, 369-381
- Isoard, S. and Winograd, M., 2013: Adaptation in Europe. Addressing risks and opportunities from climate change in the context of socio-economic developments

