



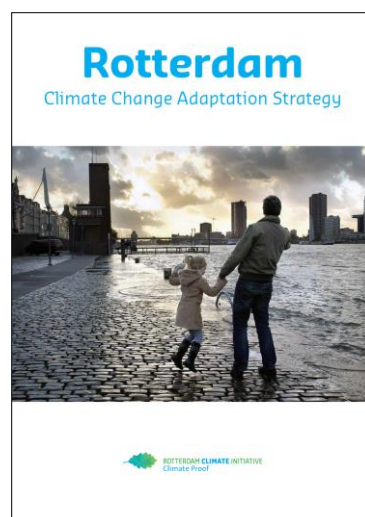
Monitoring the Rotterdam Adaptation Strategy

Chantal Oudkerk Pool



RAS: GENERAL OBJECTIVES

- Protection from river and sea
- Minimal disruption from too much or too little rainfall
- Accessible and safe port
- Community awareness
- CCA leads to a more attractive city
- CCA strengthens economy



MONITORING OBJECTIVES

- Report progress to council and citizens:
 - Accountability
 - Communication
- Learn and improve adaptation efforts



MONITORING: 5 dimensions

- Risks (probability*consequence)
- Targets (how much is enough?)
- Effort (how many m2/m3 etc added?)
- Effect (of implemented measures)
- Speed (are we going fast enough?)

New developments & knowledge lead to new risks/targets/effects and might require adjustments in speed.



MONITORING: levels & frequencies

Indicator	Level	Frequency
Risks	city	8-10 years
Targets	district	4 yrs
Effort	project	yearly
Effect	project	yearly
Speed	city	8-10 years



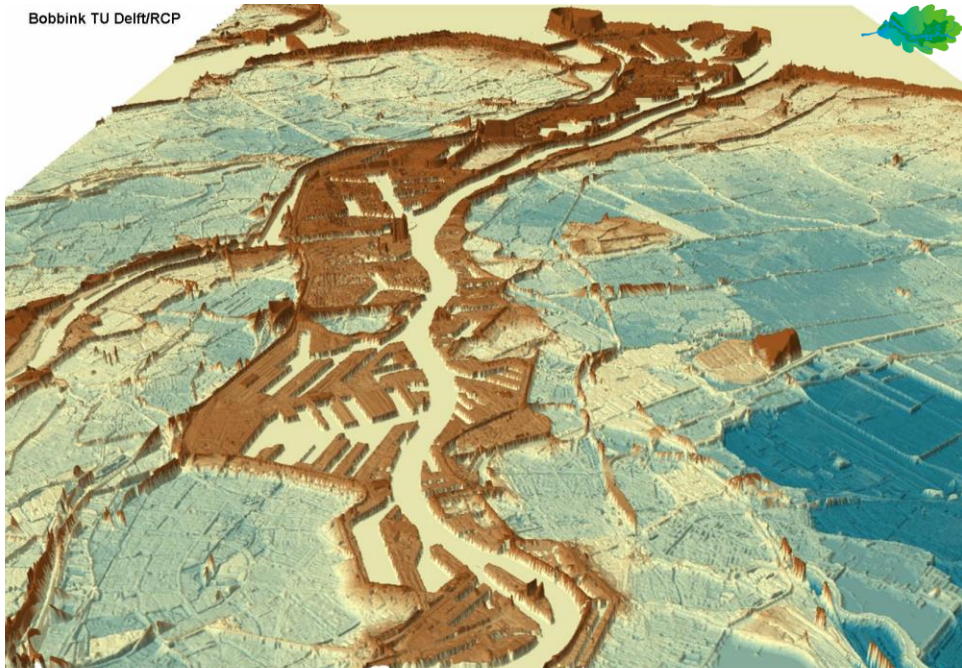
RISK: CLIMATE CHANGE SCENARIOS

Baseline = RAS.

Monitor changes in expected:

- SLR and river discharge;
- Extreme rainfall
- Number of tropical days
- Rainfall deficit



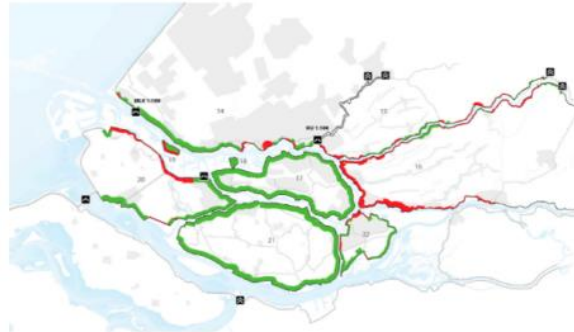


HEIGHT MAP: ABOVE AND BELOW SEA LEVEL

APPROACH & OBJECTIVES

- Maintain current robust system
- where necessary: reinforce the dikes
- Improve emergency response organisation

Dike height surplus & deficit



Opgave tot 2050 dijkhoogtetekort of -overschot

- hoogtetekort of -overschot ten opzichte van HBN 2050 REF
- klimaat + zetting + nieuwe norm als er niets aan de dijken zou worden gedaan ten opzichte van de referentiesituatie 2015
- overslagcriterium 0,1 l/m/s met uitzondering van Rivierenland en HRSK (zonder Hollandse IJssel): 1,0 l/m/s

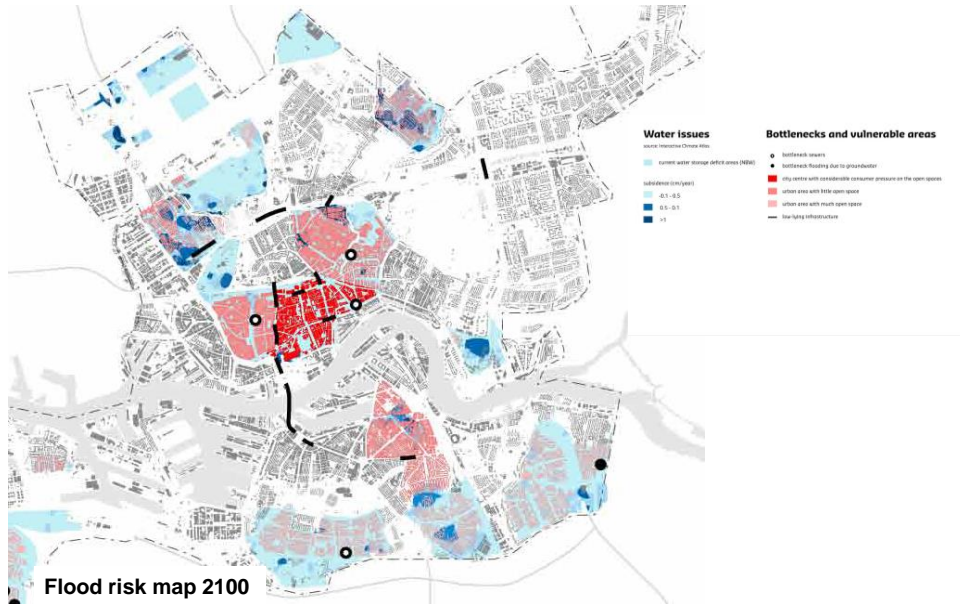
overhoogte	hoogtetekort	HBN 2050	faalkans Maeslantkering
—	— 0 - 25 cm	HBN 2050	faalkans Hollandse IJsselkering
—	— 25 - 50 cm	■	dam
—	— 50 - 75 cm	■	stormvloedkering
—	— 75 - 100 cm	■	dam met scheepvaartsluis
—	— 100 - 125 cm	14	dijkingsnummer
—	— > 125 cm		

FLOOD RISK (RIVER & SEA)

- % of dikes that have been upgraded to 2050 standards;
- Evacuation plan still up to date yes/no;
- Vulnerability of essential infrastructure;
- Impact: socio-economic development



Flood from rain

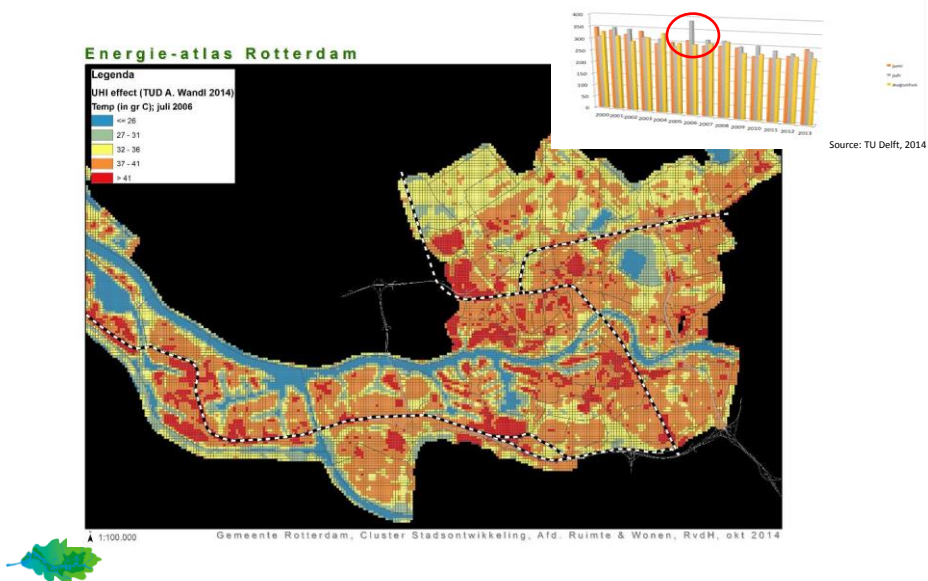


FLOODING (RAIN)

- Quantitative map of required water storage capacity;
- Sealed soil ratio;
- Sponge capacity > 3Di



EXTREME WEATHER EVENTS: UHI



HEAT

- 75+ Mortality above average yes/no?
- Demographic changes in vulnerable groups
- Thermal comfort
- UHI

NEXT STEPS

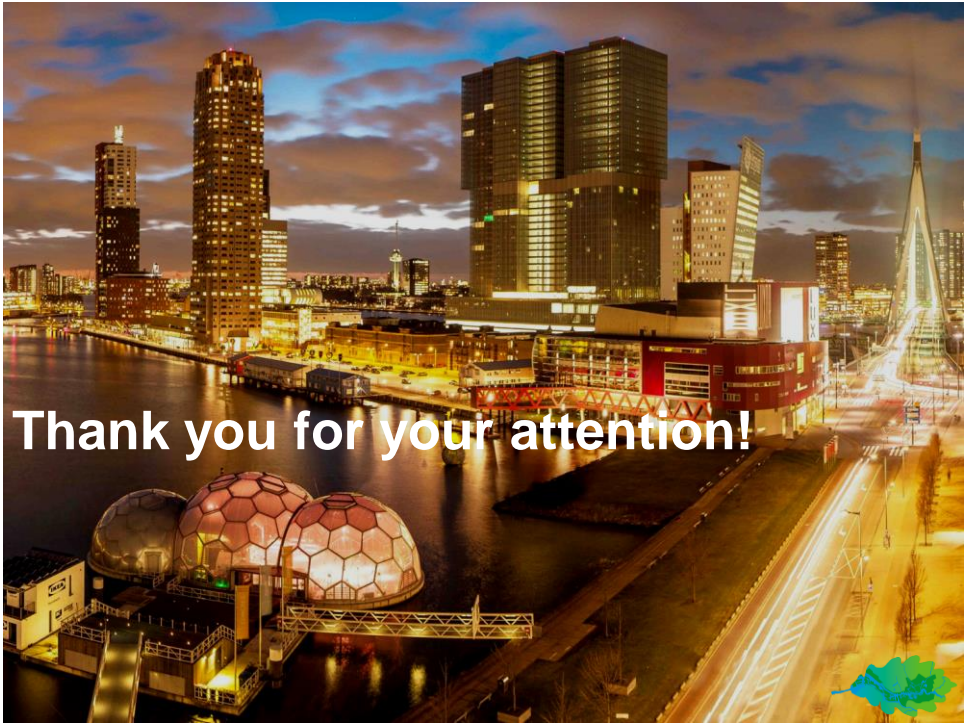
- Usefulness
- Consequences:
 - budget
 - Organisation
- Feasibility



CHALLENGES

- Internal:
 - support
 - Organisation
- External
 - Alignment with (inter)national reporting
 - Staff capacity





Thank you for your attention!