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Enabling Delta Life

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## Climate Adaptation Support Toolbox

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Deltas in Times of Climate Change II  
Rotterdam

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## How to reduce climate vulnerability?



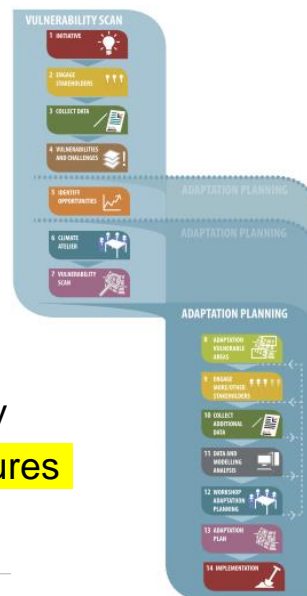
### Tiered approach

Three steps:

1: Vulnerability scan

2: Strategy to reduce vulnerability

3: Select set of adaptation measures



# Lots of adaptation measures can be taken

Many, many options:



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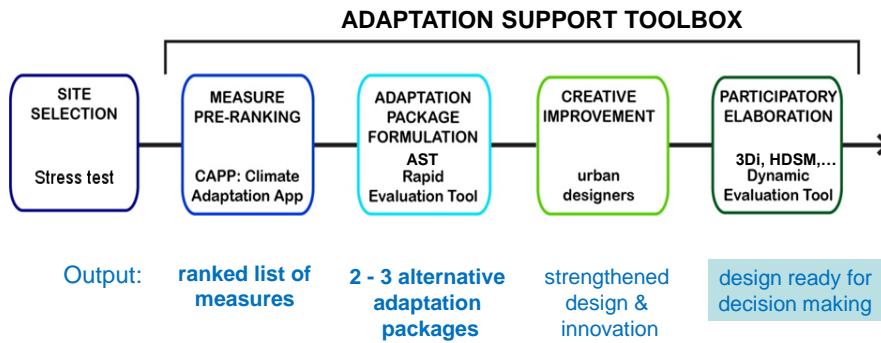
# Select and co-design solutions



e.g. on a touch-table, involving the stakeholders

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# ..with our Adaptation Support Toolbox



# Climate Adaptation App ([www.climateapp.org](http://www.climateapp.org))

**ADAPTATION SOLUTIONS**

**FILTER**

- Project type
  - Redevelopment
- Scale
  - Neighborhood
- Adaptation target
  - Groundwater flooding
- Land use
  - City Centre
- Dominant soil type
  - Peat
- Surface level and slope
  - Sloping area
  - Flat area on high ground
  - Flat area on low ground

28 Adaptation solutions

**ADAPTATION SOLUTIONS**

Canal	Seepage barrier	Improved construction site preparation
Raising land	Raising the groundfloor level	Infiltration and Transport-sewer
Emergency supplies and utilities	Pumping station	Drainage below surface level
Constructions on piles	Amphibious (floatable) constructions	Smart-drain (groundwater)

## Adaptation Support Tool

**Active measures**

Measure	Heatstress: 0.00 °C	Storage capacity:	Peak flow reduction:
Infiltration boxes	0.00 °C	3.97 m <sup>3</sup>	0.00
Infiltration boxes	0.00 °C	4.76 m <sup>3</sup>	0.00
Water squares	-0.03 °C	59.94 m <sup>3</sup>	0.05

**Contribution**

**Climate**

Metric	Value
Storage capacity:	68.67 m <sup>3</sup>
Heat reduction:	-0.03 °C
Peak flow reduction:	0.05
Drought reduction:	

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## Adaptation Support Tool

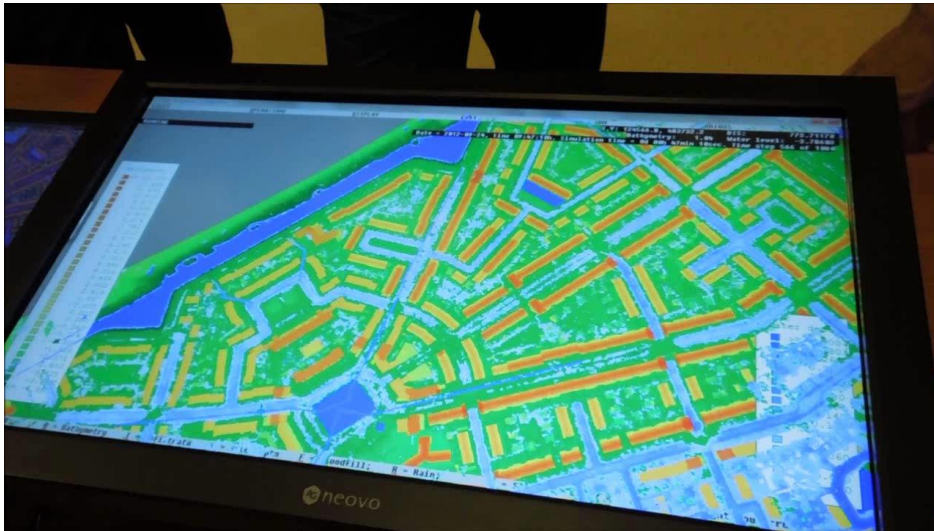
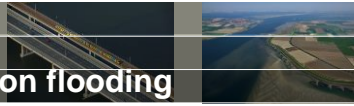
**Dashboard with performance estimates based on key figures:**

- Storage in water assignment (m<sup>3</sup>)
- Peak flow reduction ( $T_{return}$ )
- Retention for supply (m<sup>3</sup>)
- Evaporative cooling (mm/d)
- Groundwater recharge (mm/yr)
- Water quality improvement:
  - Nutrient reduction (%)
  - Heavy metals, PAH, min.oil reduction (%)
  - Bacteriological quality
- Cost (construction & maintenance)
- Benefits and co-benefits

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## Dynamic Evaluation Tools

e.g. effect of adaptation measures on flooding

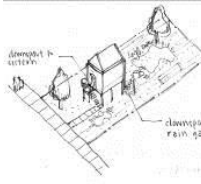
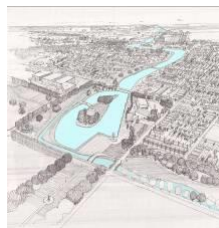
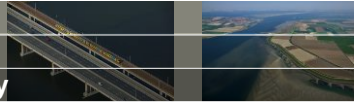


3Di on MapTable, showing flood-prone areas

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## Design support tools

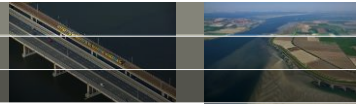
for a resilient, sustainable and healthy city



Dutch Dialogues III, April 2010, [www.dutchdialogues.com](http://www.dutchdialogues.com)  
[www.livingwithwater.com](http://www.livingwithwater.com) 2013 GNO Urban Water Plan

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## Closing



Thank you for your attention!

