



Content

1. The Netherlands (Rotterdam): history
2. Scientific project Flood risks, adaptation to CC
3. Adaptation challenges ahead

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This slide contains a table of contents for the presentation. The title 'Content' is at the top left. The list includes: '1. The Netherlands (Rotterdam): history', '2. Scientific project Flood risks, adaptation to CC', and '3. Adaptation challenges ahead'. The number '2' is at the bottom left. There is a small map of the Netherlands in the top right corner and a small white logo in the bottom right corner.

Content

1. The Netherlands (Rotterdam), history
2. Climate change
3. Adaptation challenges ahead



1953 Coastal floods



Brouwersdam





Content

1. The Netherlands (Rotterdam): history
2. Climate change
3. Adaptation challenges ahead

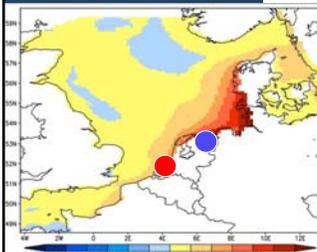
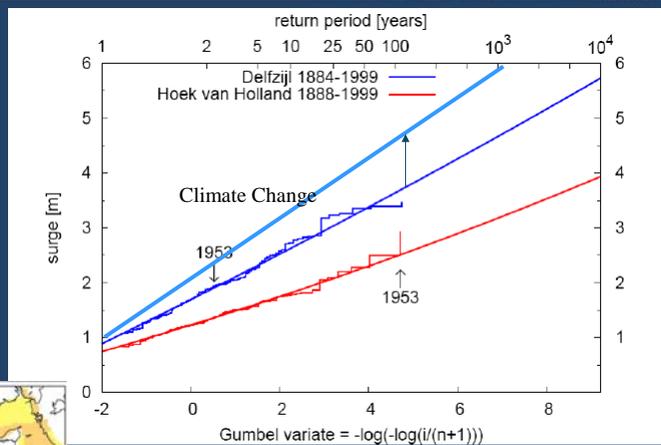


Risk based approach

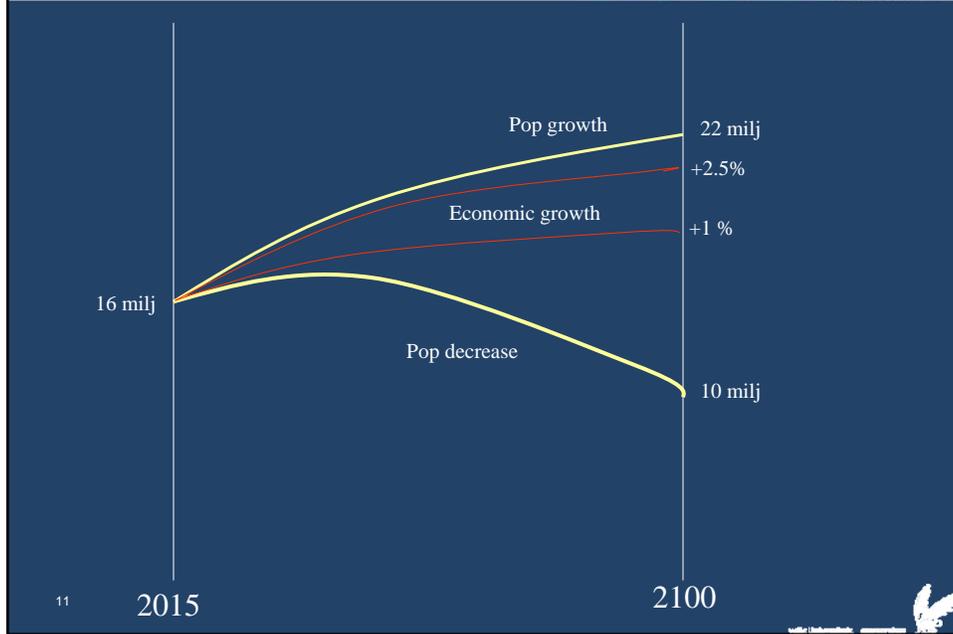
- Socio – economic impacts:
 - Casualties
 - Direct damage
 - Indirect damage
- Probability of an extreme flood
- Risk = probability * damage
- *Vulnerability: location, Adaptive capacity (o.a. finance, recovery, governance)*

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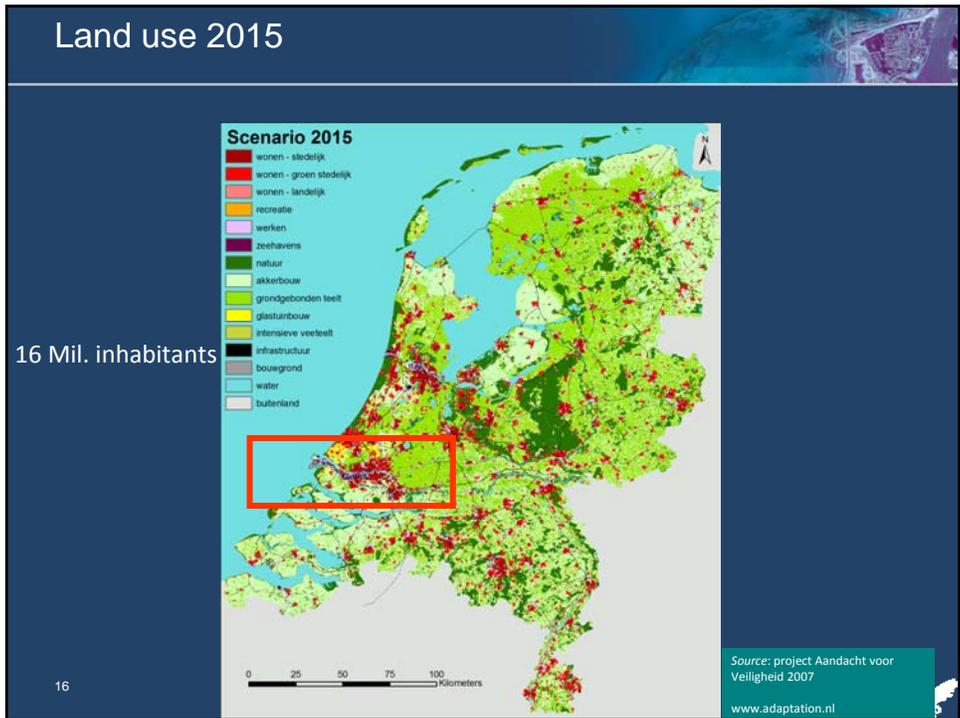
Flood probability increase



WLO scenario's: Socio Economic trends

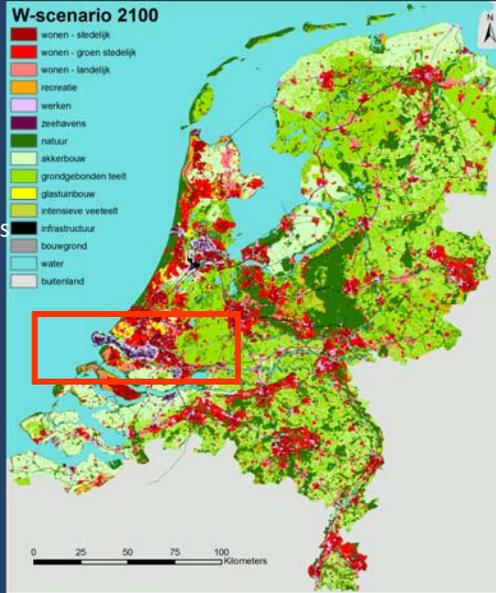




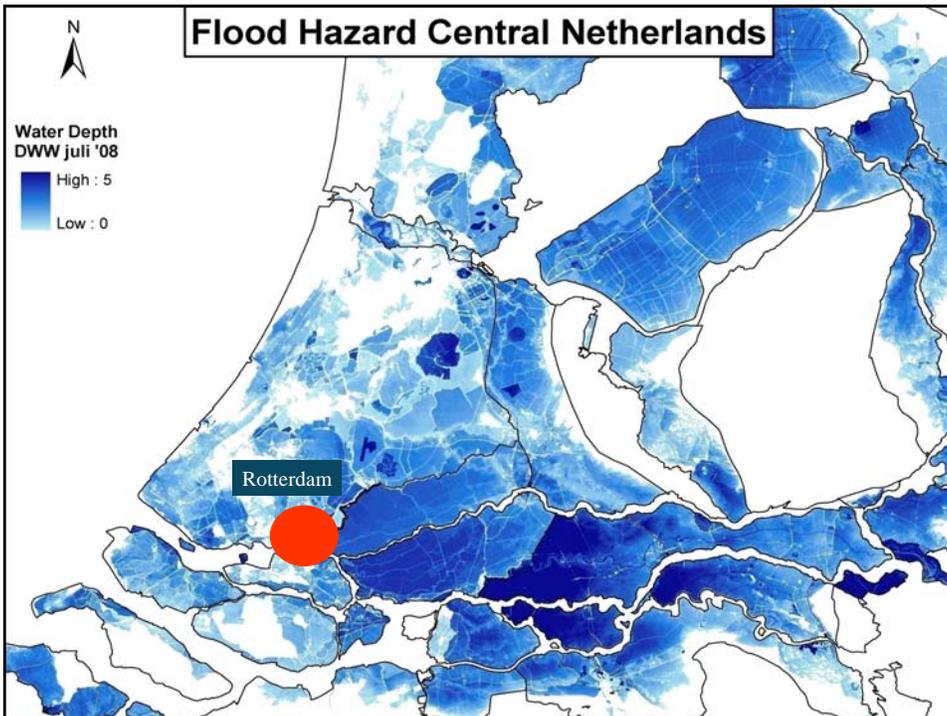


Land use 2100

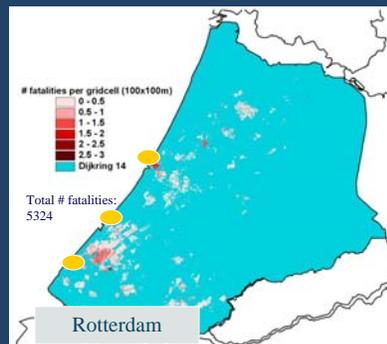
22 Mil. inhabitants



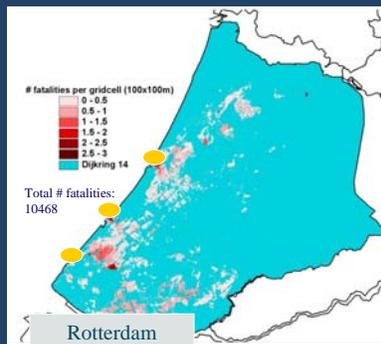
Flood Hazard Central Netherlands



Casualties



2015



2040

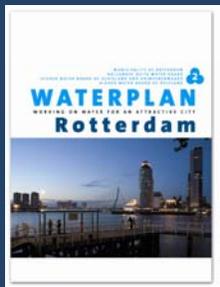
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1. The Netherlands (Rotterdam): history
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Adaptation: Involving Stakeholders & Communication



Rotterdam Waterplan 2030



Rotterdam
Climate
proof

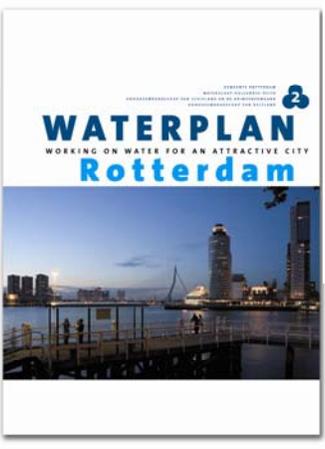


National flood adaptation plan : 2100 → 2200



Netherlands: +/- 20 million m³ sand/ year

Rotterdam adaptation plan 2030



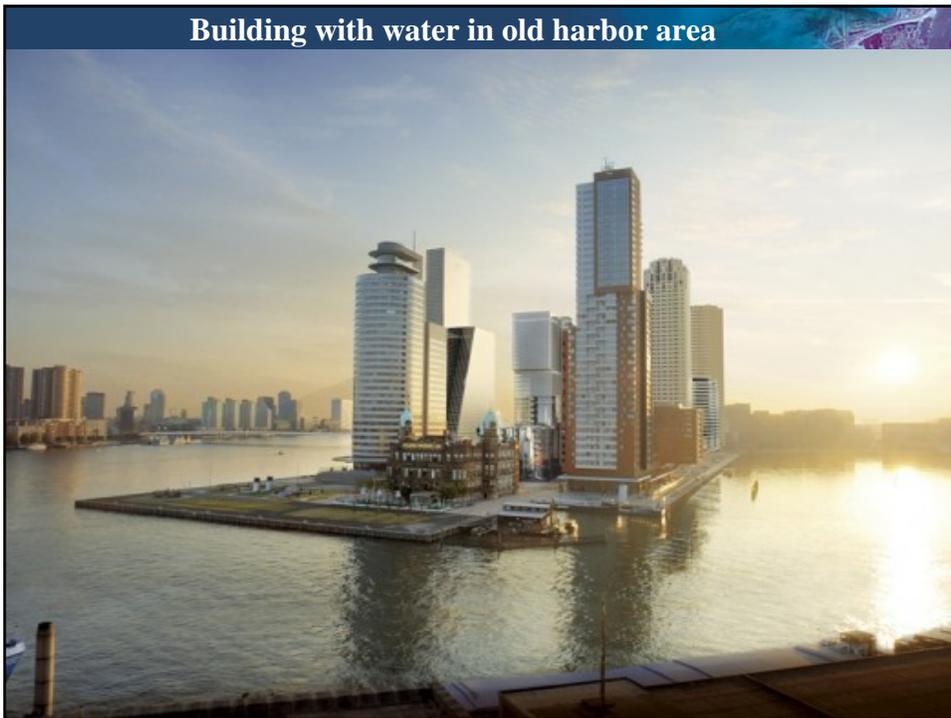
WATERPLAN
WORKING ON WATER FOR AN ATTRACTIVE CITY
Rotterdam

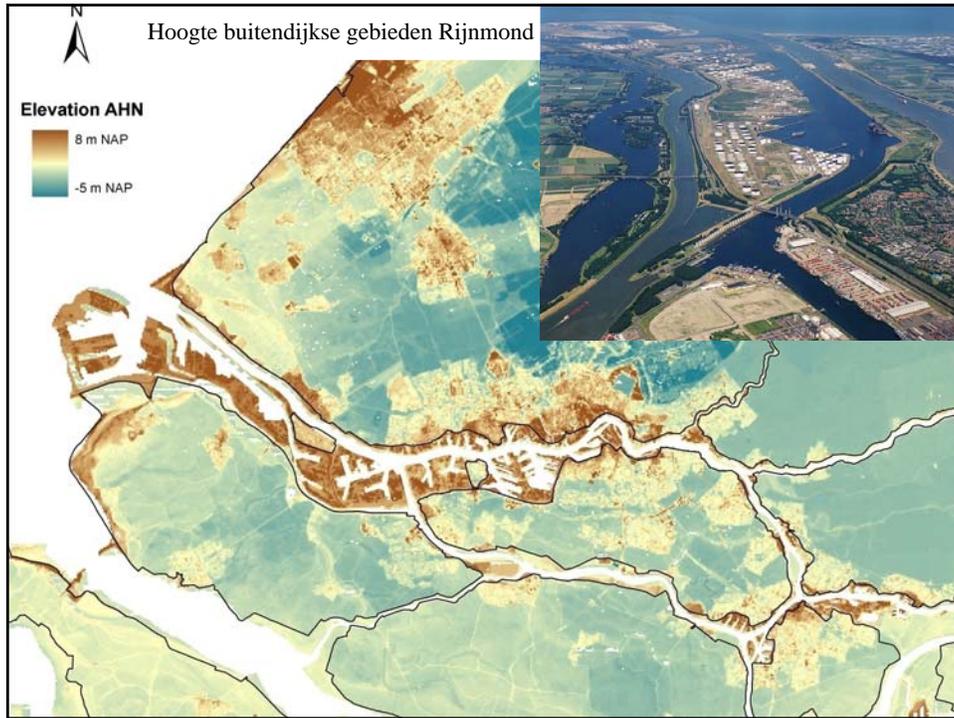
VISION OF ROTTERDAM WATER CITY 2030



- GENERAL**
 - residential areas
 - new residential areas
 - urban development
 - industry and business parks
 - ports and docks
- WATER CITY**
 - floating housing within the quay
 - new development within the quay
 - quay in quay
 - quay in quay housing
 - quay in quay housing
 - industry and business parks within the quay
- WATER**
 - waterways and canals
 - water bodies
 - green roofs
 - green facades
 - green roofs on buildings and structures
- DOCK**
 - quays in the quay
 - quays within the quay
- DOCK OF DOCKS**
 - quays within the quay
 - quays within the quay

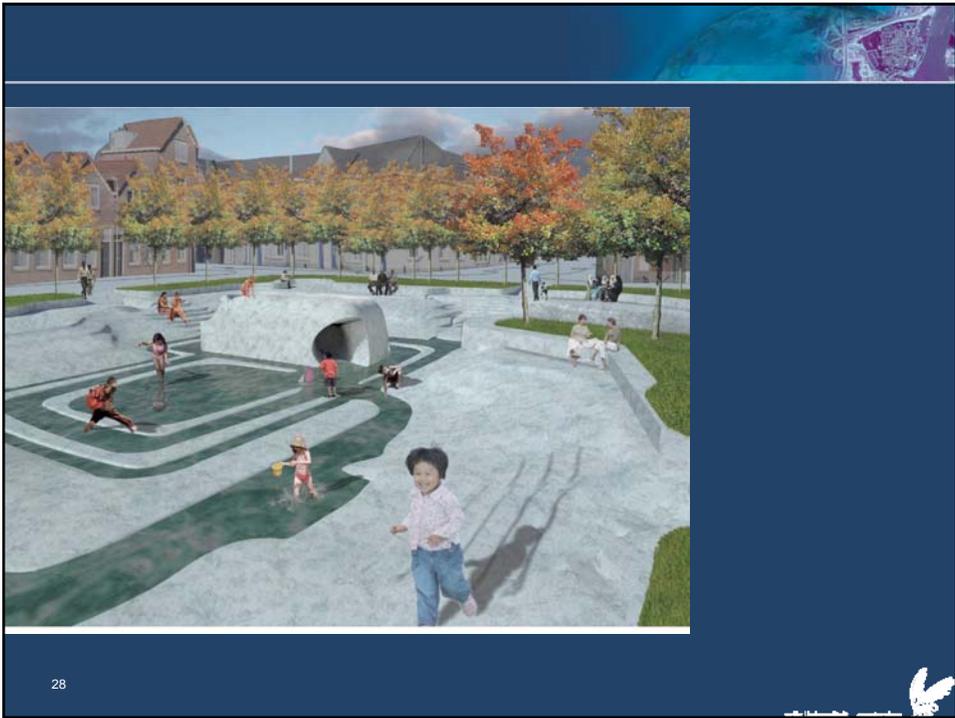
Building with water in old harbor area

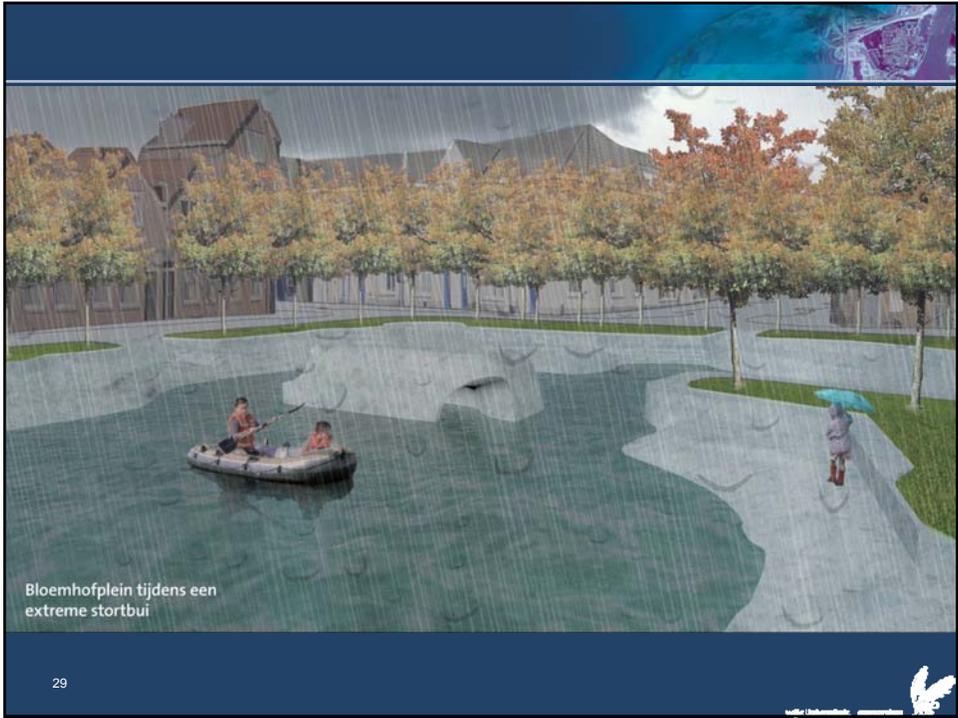




Green roofs / underground water storage

This complex block illustrates green roofs and underground water storage. The top section features the title 'Green roofs / underground water storage' in white text on a dark blue background. Below the title, there are two main images. On the left, a photograph shows two construction workers wearing green hard hats and gloves, unrolling a large roll of vegetation matting on a rooftop. On the right, a 3D architectural rendering shows a building with a green roof. A cutaway section of the building reveals an underground water storage reservoir. The rendering includes a car parked on the roof and a person walking on the green roof surface. In the bottom right corner, there is a small white logo of a bird.



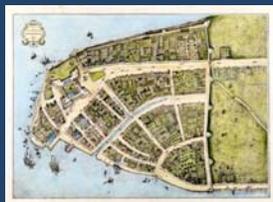


Costs of adaptation

	Scenario's				
	2040	2100	2100	2100	Verre Toekomst
SLR [cm]	24	60	85	150	500
Max Discharge Rhine [m3/s]	16.800	18.000	18.000	18.000	18.000
Max Discharge Meuse [m3/s]	4200	4.600	4.600	4.600	4.600
		Costs [Billions Euro's]			
Re enforcement Levees					
	2,7	5,5	5,5	5,5	5,5
	1,3	4,2	4,2	4,2	4,2
Billions Euros	0,2	1,8	2,6	6,1	36
Beach nourishment					
	1,9	6,4	9,1	16,0	25
	1,1	3,8	5,4	9,6	?
Billions Euros	0,1	0,4	0,6	1,1	?
	1,9	2,3	2,6	3,4	8
Totaal	9	24	30	46	>80



Jakarta 1652



New York 1660



Rotterdam 1652

Connecting Delta Cities



Jakarta 1652



New York 1660



Rotterdam 1652



Share same Water threats, values and challenges

Water Risk



Water Opportunity Challenges





Challenges can be tackled by
Connecting people from Delta Cities!

www.deltacities.com

Delta Conference Rotterdam
sep. 29-oct 3 , 2010

