



## Towards a Knowledge to Knowledge network (K2K)

September 2014

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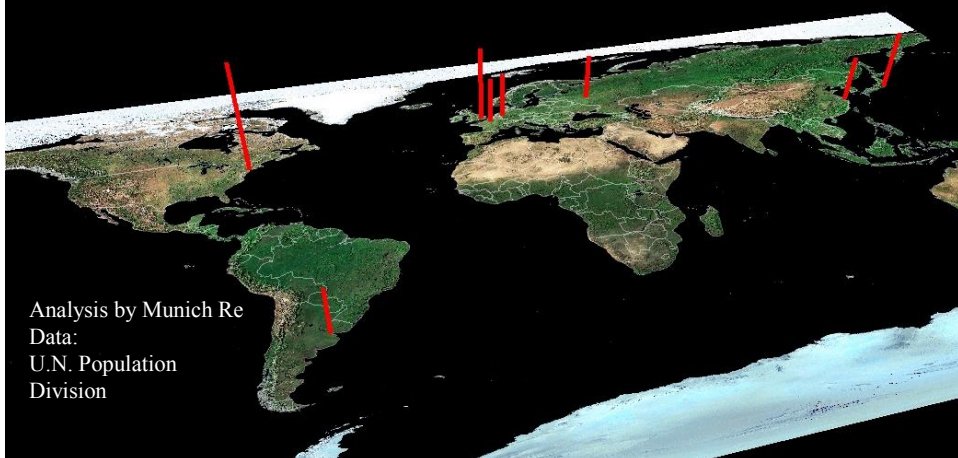
[www.deltacities.nl](http://www.deltacities.nl)

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## Mega-cities with over 5 million inhabitants

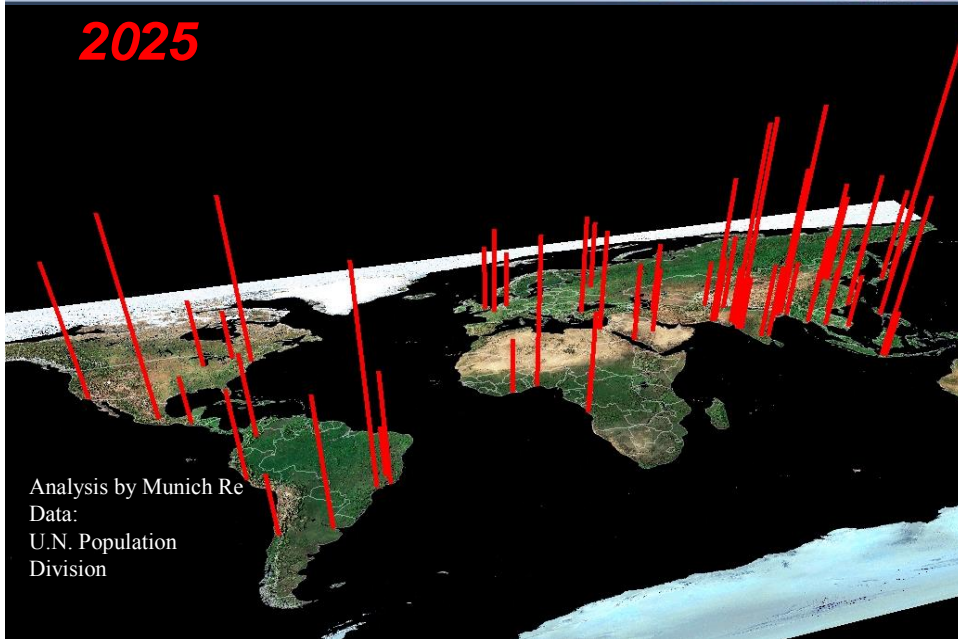
**1950**



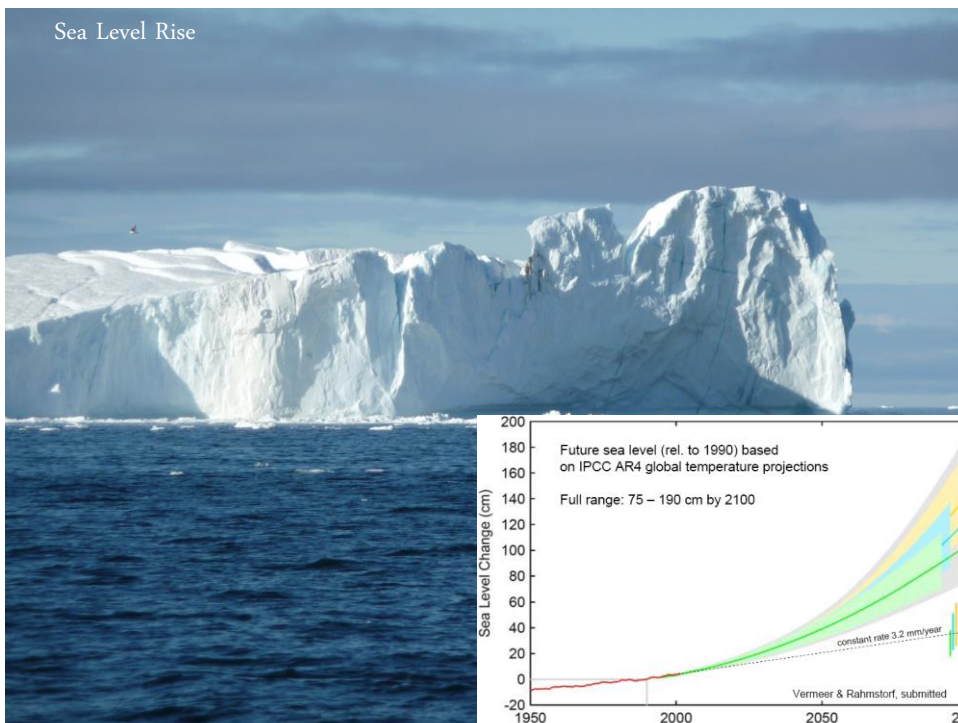
Analysis by Munich Re  
Data:  
U.N. Population  
Division

## Mega-cities with over 5 million inhabitants

**2025**



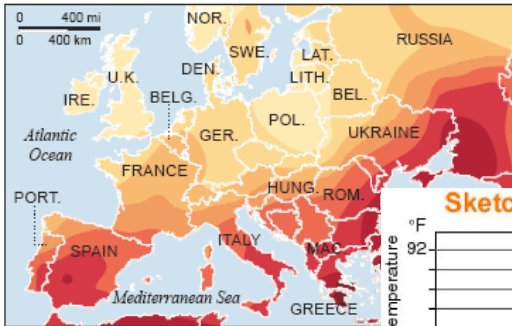
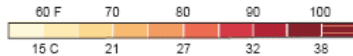
## Sea Level Rise



## Oppressive heat settles in Europe

Officials warned citizens, especially the elderly, to stay indoors and drink plenty of water during the summer's second major heat wave.

Temperature,  
Wednesday,  
10 a.m. EDT

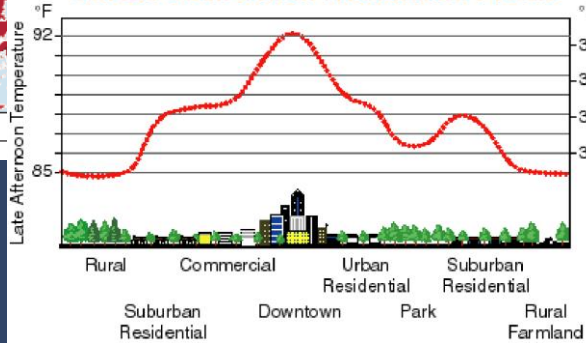


NOTE: Average temperatures from highest to lowest elevation

SOURCE: Weather Underground

## Drought & Heat island

### Sketch of an Urban Heat-Island Profile





Solutions + method to reduce impacts?



Often found in private sector



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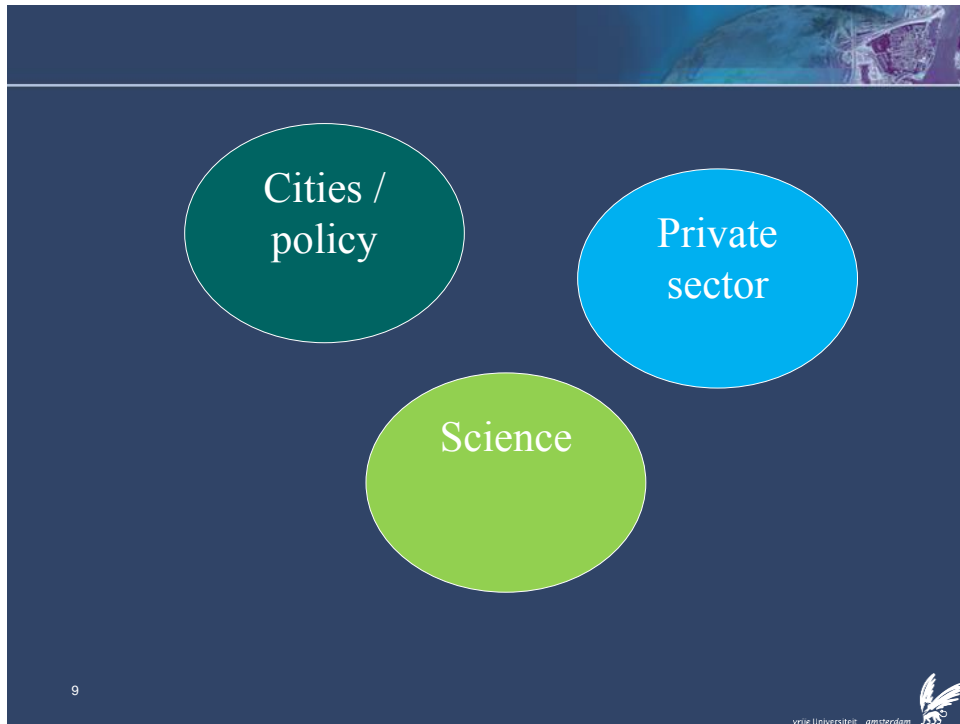


## Rotterdam Waterplan 2030



- new residential areas
- ribbon developments
- industry and business parks
- parks and woods
- RIVIER CITY**
- existing housing outside the dykes
- new development outside the dykes
- dyke as dyke
- dyke as urban balcony
- dyke as urban balcony
- industry and business parks outside the
- NOOED**
- drainage pools and canals
- water squares
- green roofs
- water gardens
- (new) areas for nature and recreation
- ZUID**
- canals in Oud Zuid
- water squares in Oud Zuid
- green roofs in Oud Zuid
- water squares in the garden cities
- water jewel Zuiderpark
- open water connection Zuiderpark Ca
- temporary water collection



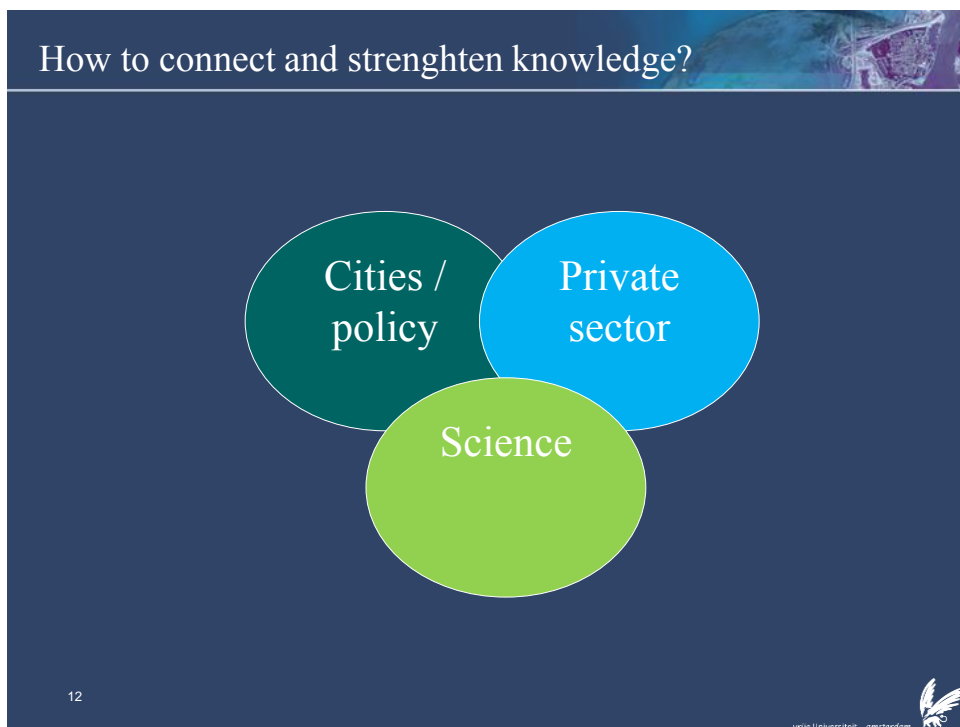
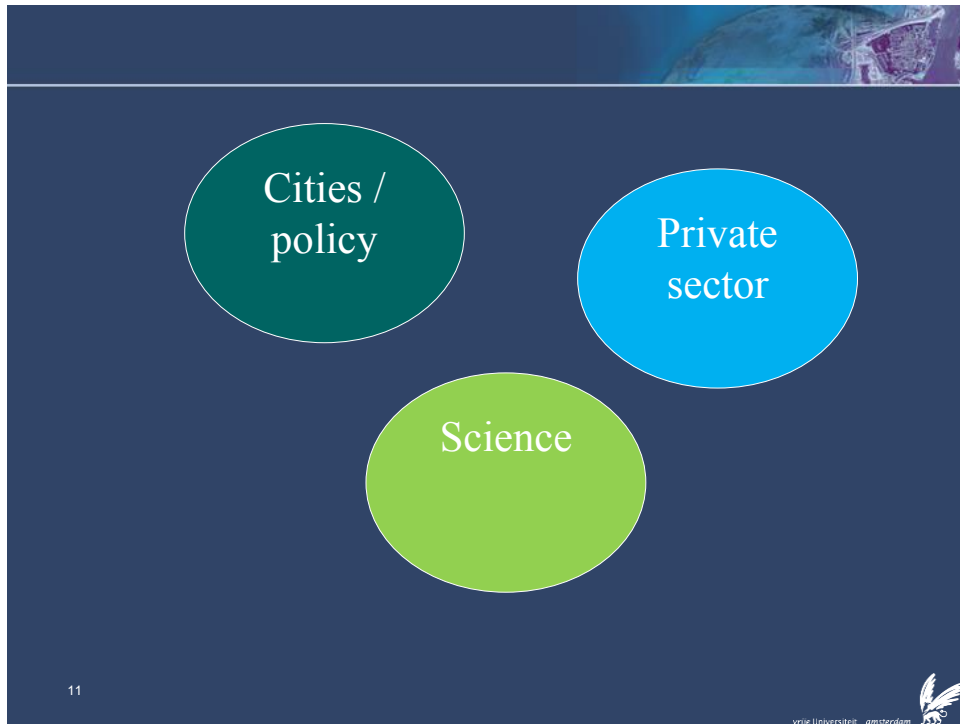


### Challenges

- Public sector / cities:
  - How to make policy anticipating to future changes, including uncertainties?
- Science:
  - how to translate results into policy relevant information?
  - How to formulate research questions that are relevant to policy?
- Private Sector
  - How to connect knowledge and innovation to long term adaptation strategies of cities?


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YEARS OF LIVING DANGEROUSLY

0:09 / 1:07

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YEARS OF LIVING DANGEROUSLY

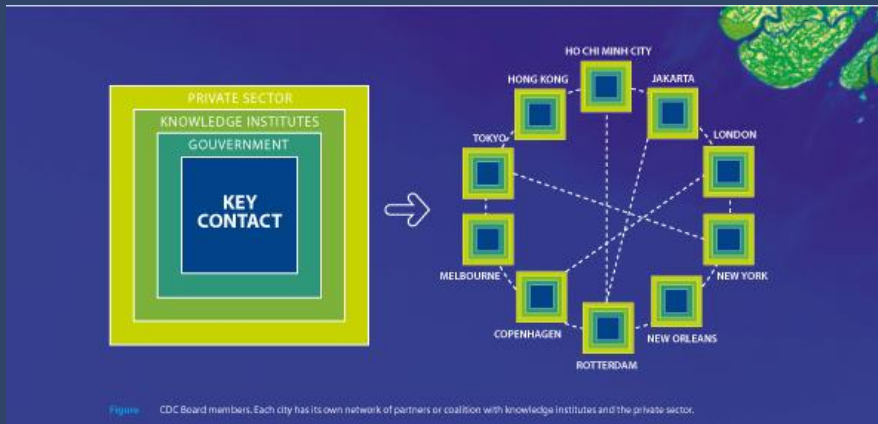
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## City network, with focus on Policy



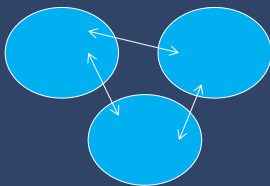
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## How to develop integrated approach, including K2K?



Contact city: bi lateral / through C40,  
and offer support



Establish K2K network  
between City Institutes +  
international specialists



Agree on process toward adaptation plan

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Combine knowledge, and search for tailored solutions

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**WATERPLAN Rotterdam 2**  
WERKEN AAN WATER VOOR EEN AANTREKKELIJKE STAD

◆ Before the construction of a super levee



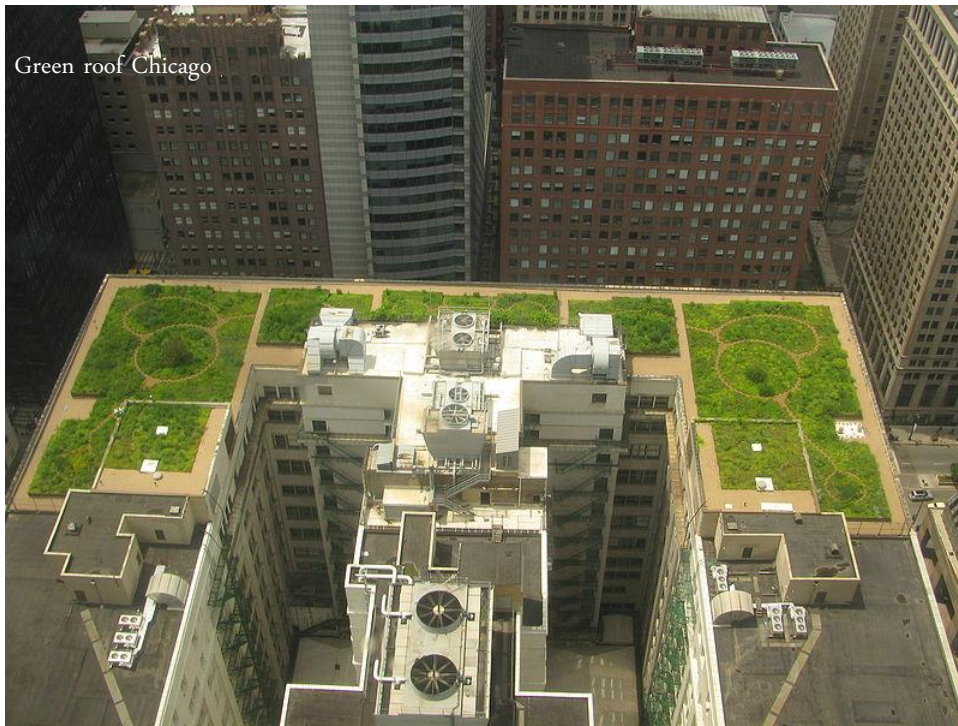
◆ After the construction of a super levee



◆ Normal land use is allowed in the special super levee zone.



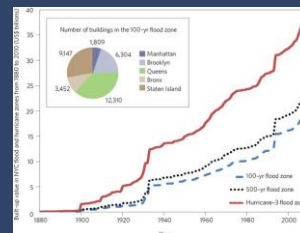
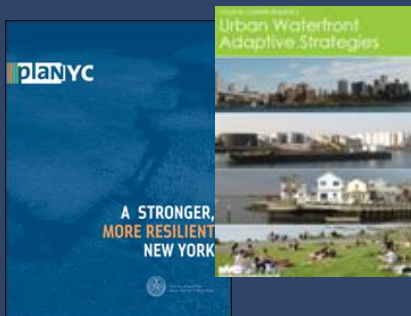
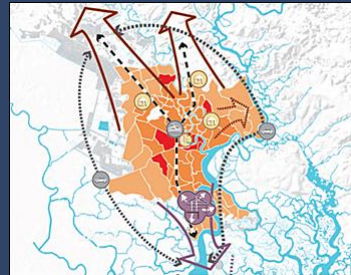

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Green roofs  
Japan



## Result: adaptation plans for Pilot cities



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Start of K2K networks





## INTERNATIONAL NETWORK FOR RESILIENT WATERFRONT COMMUNITIES

*Inclusive Innovation for Resilience in Delta Cities*



### Goal:

A network of game changers to foster local implementation of smart and sustainable solutions to enhance resiliency and adaptation of waterfront communities

### Initial actions:

- Online Community of Practice
- Joint research and education on implementation of resiliency and adaptation measures
- Onsite exchange of community leaders, students and researchers

[www.rdmcampus.nl/rwc](http://www.rdmcampus.nl/rwc)

Scope for K2k network CDC?

How to proceed



Thanks for your attention!

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Drought

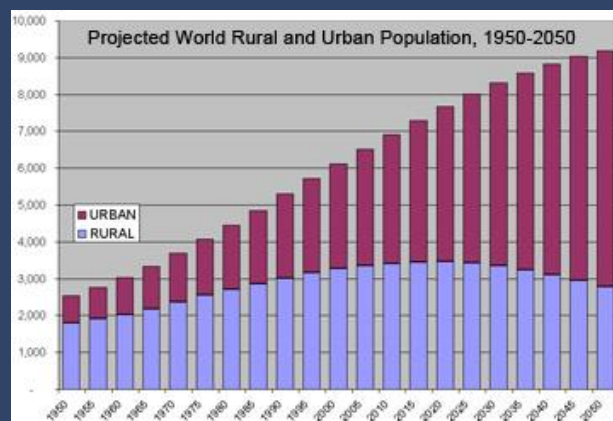


## Urban Heat Island

- temperature difference can be as much as 4°C
- Climate Change will enhance the heat island effect

## Urban Growth

2009: 50% of global population lives in cities  
 2050: 70 % of global population lives in cities







## Land Use Change



'New Amsterdam, 1664'

## Land Use Change ~ 1880



## Land Use Change



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## Risk

- Climate Change increase probability of event
  - Floods
  - Droughts
- Land use change increase potential consequence/ damage

Tokyo



**Risk : Probability of a flood \* Damage**

City	Current Exposure		Approximate Protection Standard (Return period in years)	Annual Average Risk (Residual Risk)	
	Population (000)	Assets (US\$ bil)		Population (000/yr)	Assets (US\$ bil/yr)
London	397	60	1:1000	0.4	0.06
Shanghai	2,353	73	1:1000	2	0.07
Osaka	1,373	216	1:300	4.6	0.7
New York	1,540	320	1:100	15	3.2
Tokyo	1,110	174	1:1000	1	0.174
Amsterdam	839	128	1:10000	0.08	0.013
Rotterdam	752	115	1:10000	0.08	0.011
New Orleans	1124	234	1:200 <sup>11</sup>	5.1	1.168.4

Nichols et al, 2008



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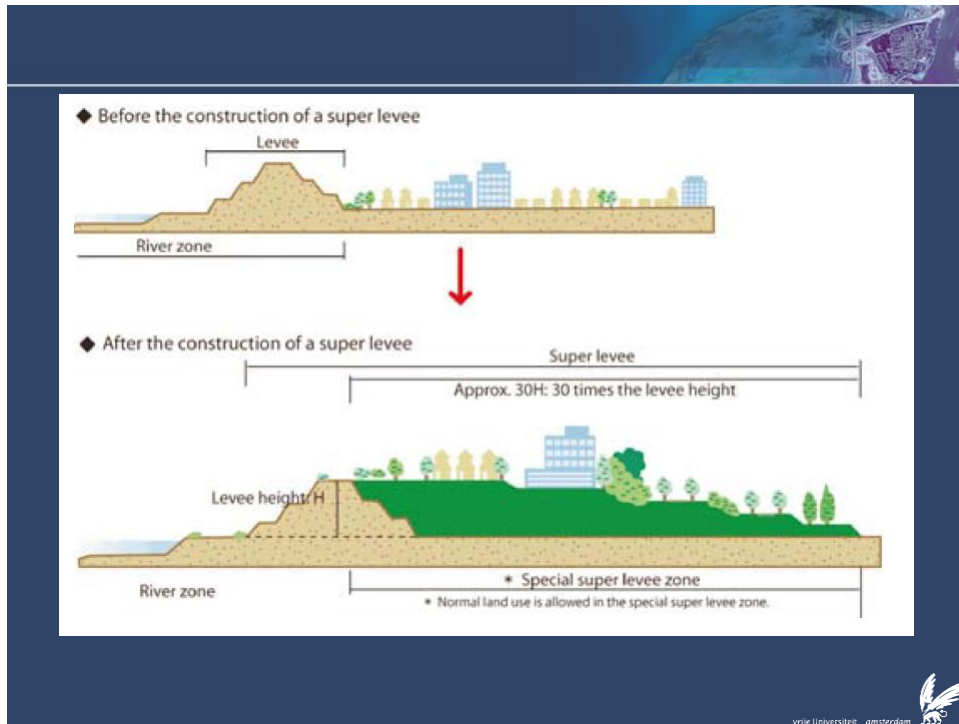
Nichols et al, 2008



Adaptation







Hamburg, Hafencity: +7m above mean Sea level



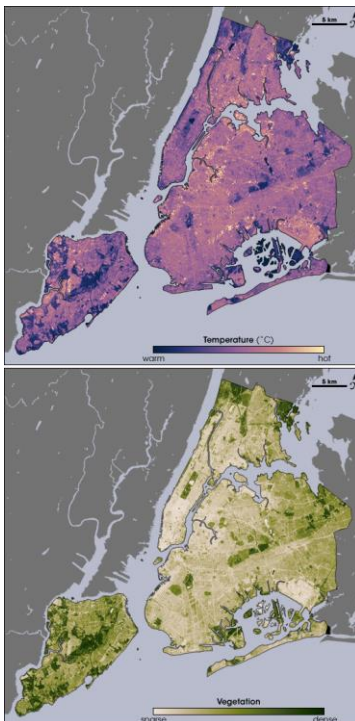
## Architecture: solar power

Photo voltaic panel: produces about 900 - 1,200 watts of electricity on a sunny day.

Source: University of Wisconsin



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More Green in city: lower temperatures

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## Multifunctional land use

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## Long Term --- Short Term



## Conclusions

- Adaptation very much related to city planning
- Mainstreaming adaptation measures into current investments
- Challenge for new architecture
- Tensions: short term – long term perspective
- Who pays?

Thanks!

[www.adaptation.nl](http://www.adaptation.nl)  
[www.deltacities.com](http://www.deltacities.com)