RAMSES
Science for cities in transition

Reconciling Adaptation, Mitigation and SustainablE development for citieS

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ICLEI
NTNU Det skapende universitet
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Institut Veolia Environnement

Why cities + adaptation + mitigation + sust. development + cost assessments

Cities play an important role in the sustainability transition

Certain cities are more other are less efficient in terms of emissions

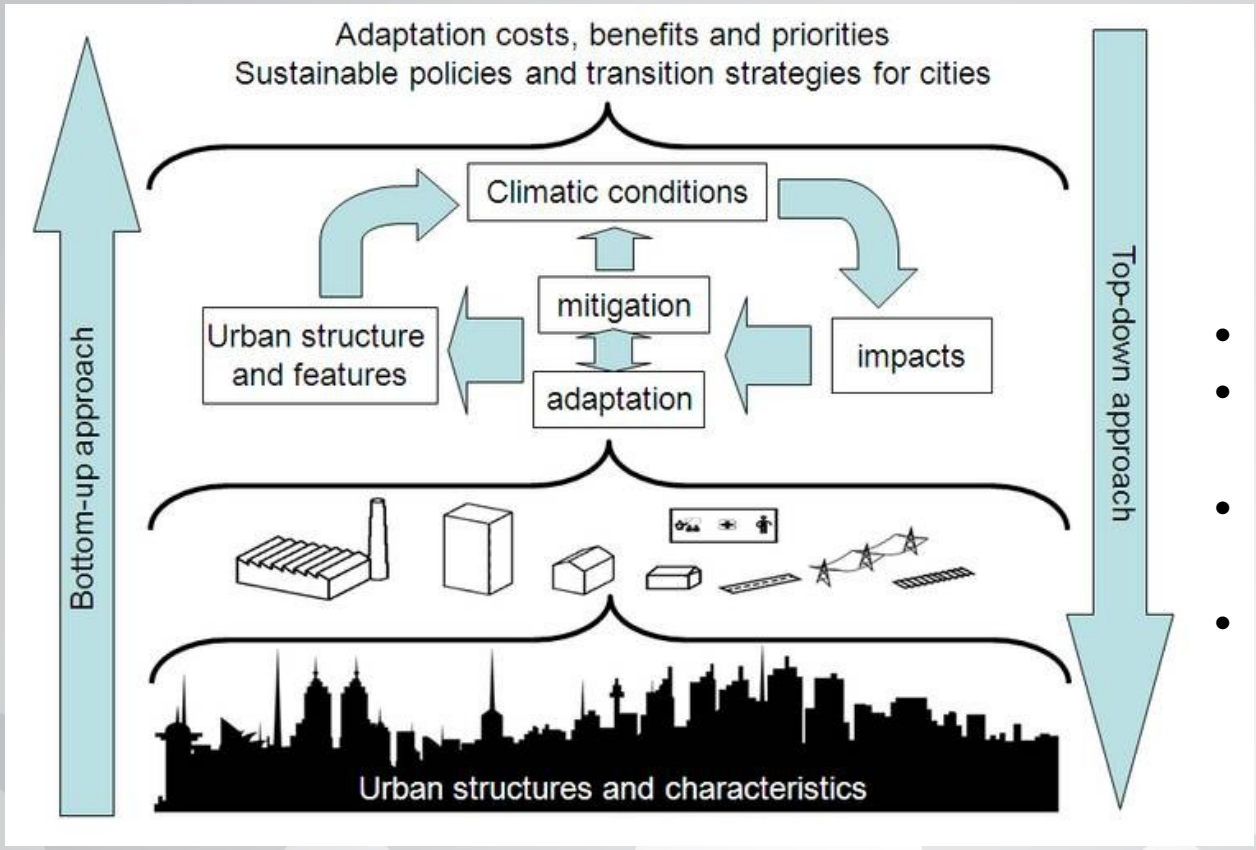
Cities are perfect places to generate co-benefits

Cost assessments should make clear where we have limits

Knowledge about gross effects are needed for global policy making, while on the ground more detailed information is needed for more concrete policy making

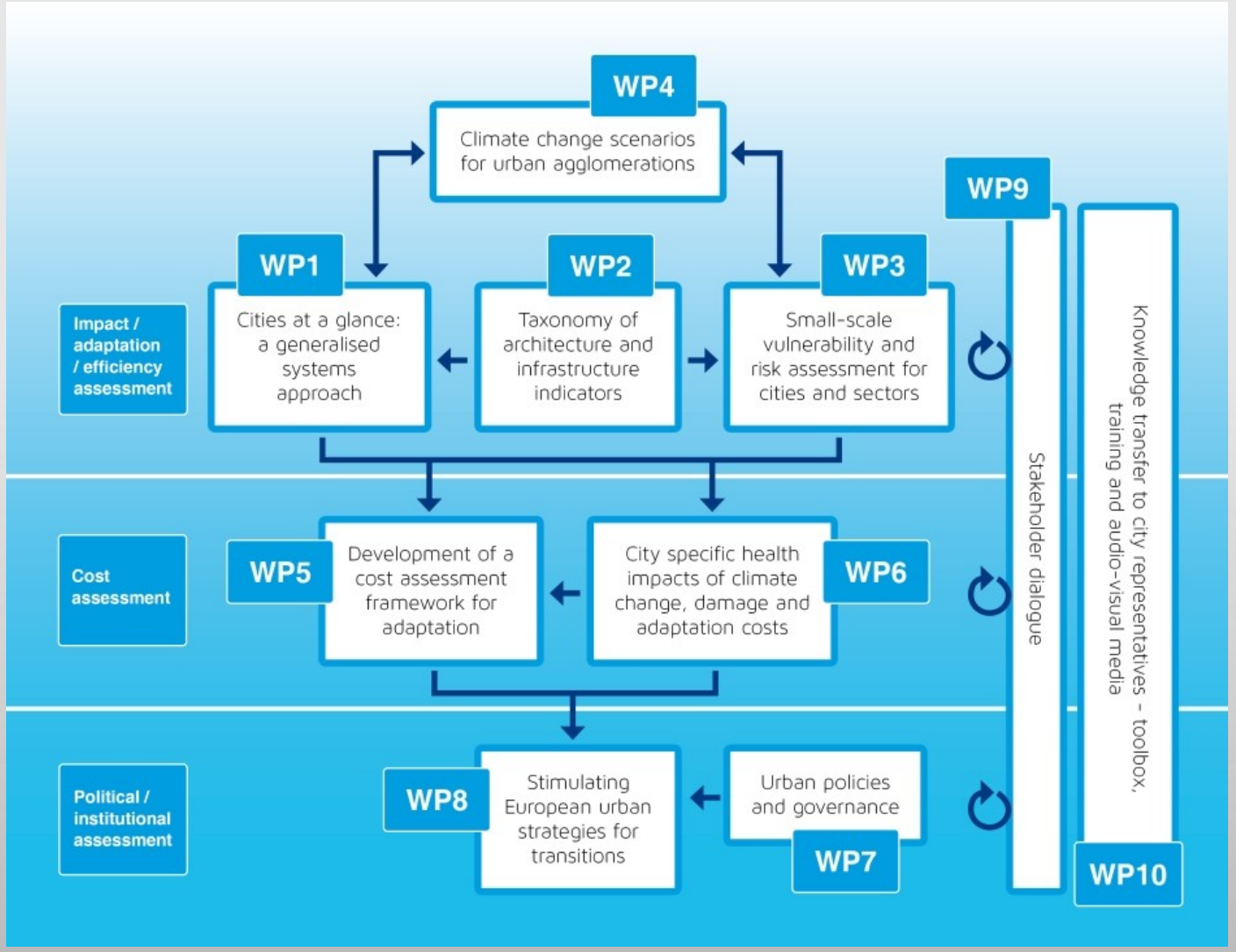
Background

Combination of top-down and bottom-up concepts is needed and a synthesis between both approaches in order to obtain an overview of climate threats, actual and future damages, costs and potential adaptation



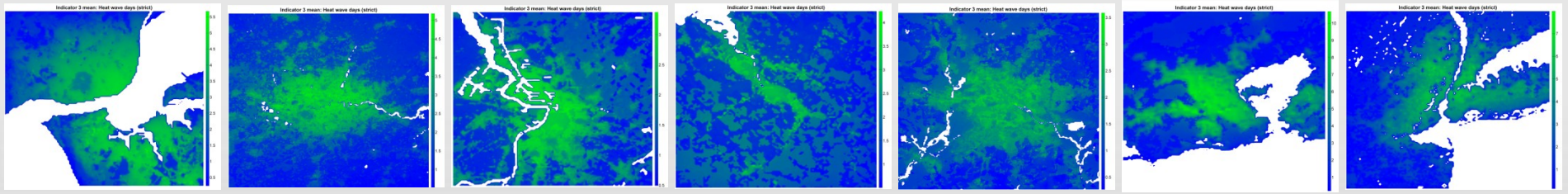
- Case study analyses
- Simplified approaches which are transferable
- Intensive stakeholder dialogues
- Involvement of media and education experts

Workpackage Organisation

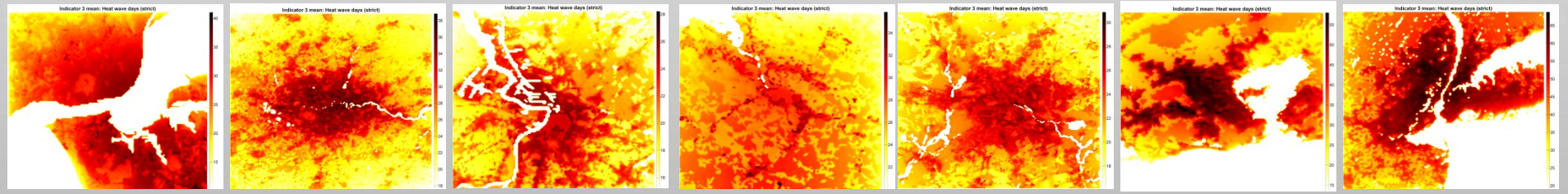


Urban climate modeling / projections

1986-2005: under present conditions, cities experience twice as many heat wave days than nearby rural areas

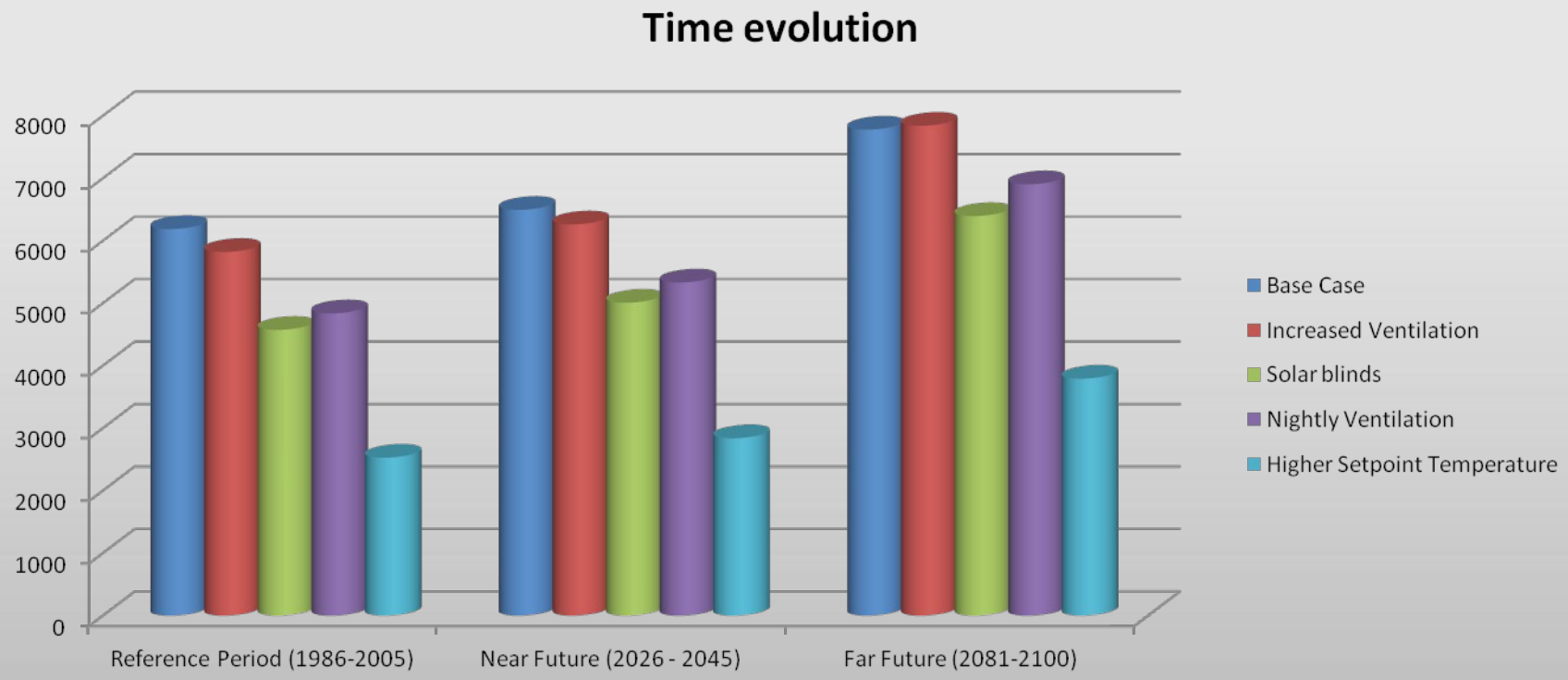


2081-2100 (RCP8.5): the number of heat wave days is projected to increase by a factor of ten, to nearly 30 heat wave days per year



Cooling Energy Demand

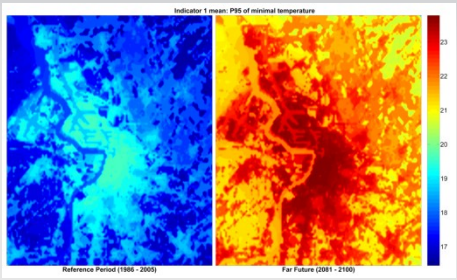
- cooling energy demand in an office building using UrbClim and EnergyPlus current situation and future periods (using RCP8.5)
- 4 adaptation measures were considered



Cooling energy demand of an example office building in Antwerp (kWh per year)

Climate Change

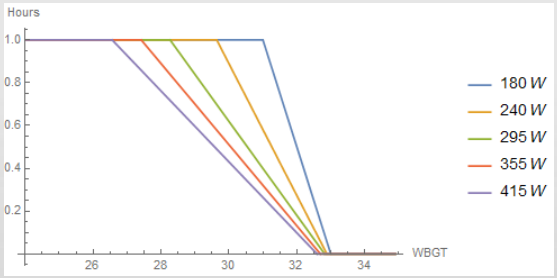
Temperature



Urban Heat

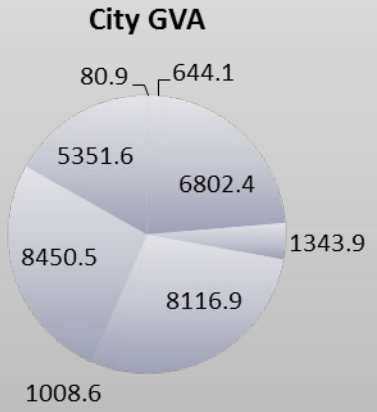
Adaptation Measures:
-Behavioural adaptation
-Increased ventilation
-Air conditioning
-Solar blinds
-Increased insulation

Three standards of productivity loss

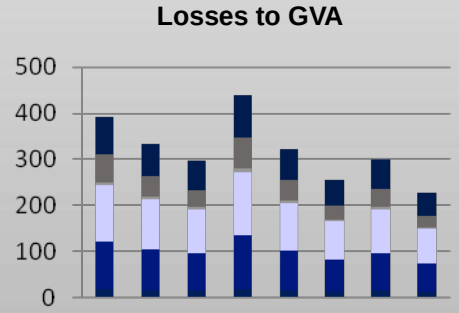


Worker Productivity

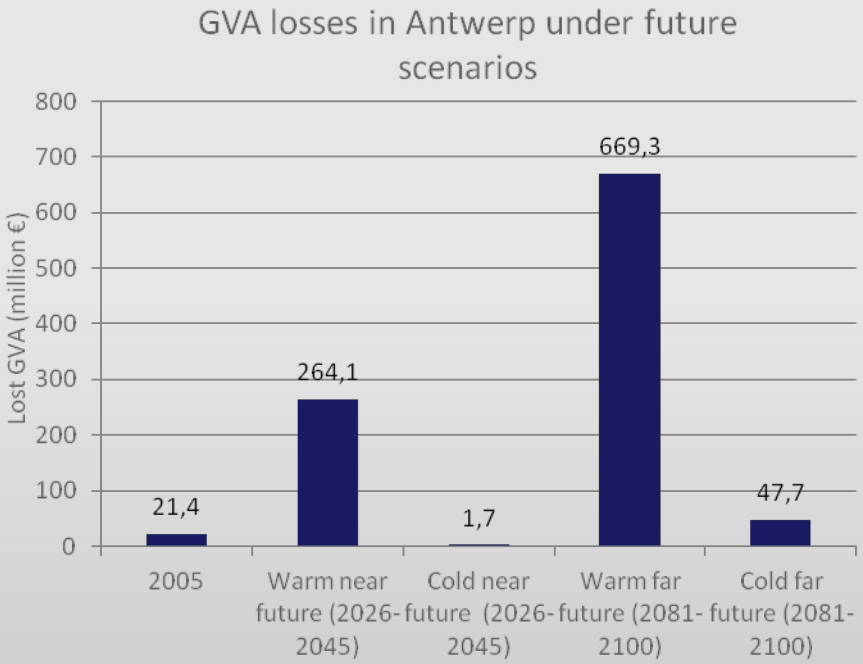
Structure of the City Economy

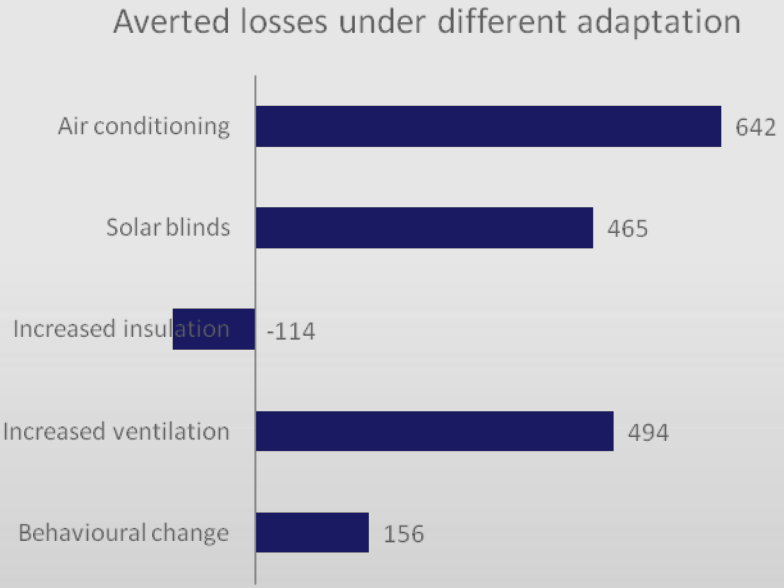


City Economic Production (Gross Value Added)



Early results: Antwerp





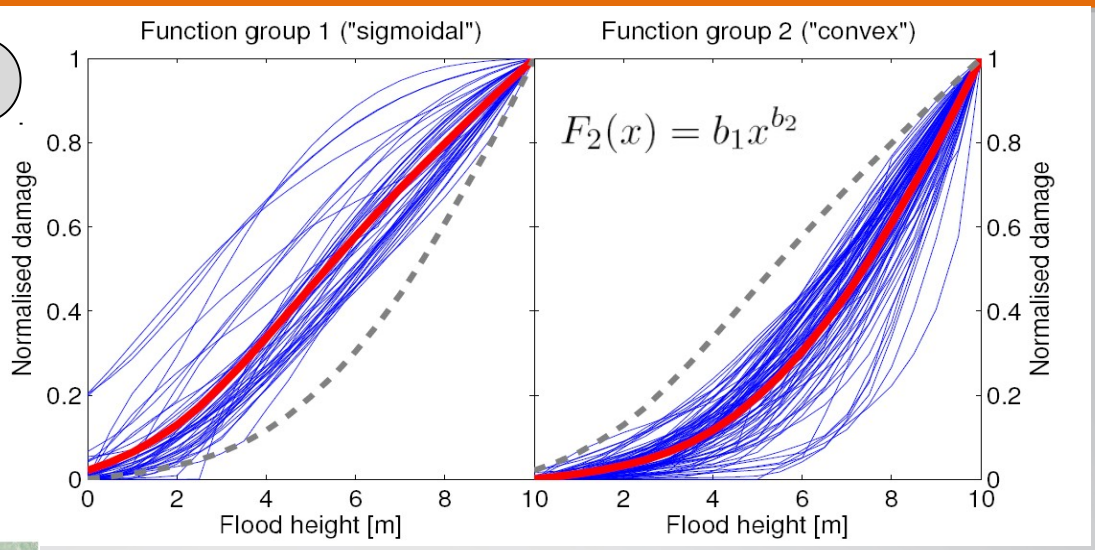
Antwerp, warm year in far future (2081-2100)
Values in million €

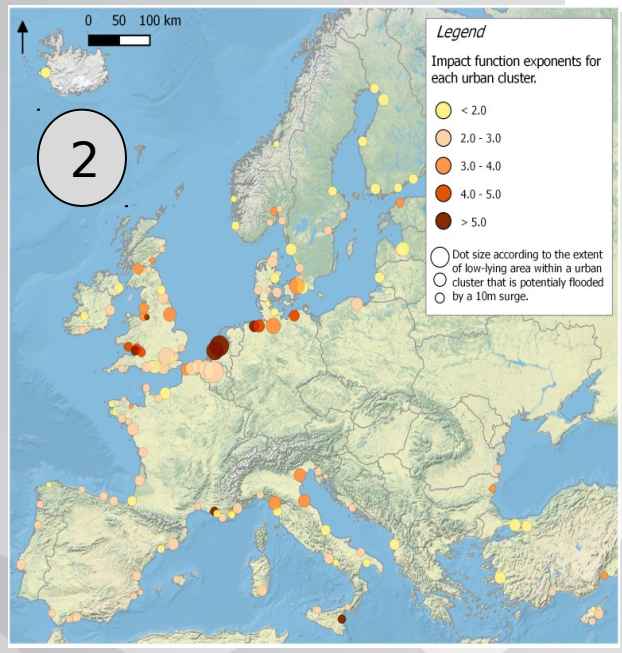
Damage functions for 140 European Coastal Cities and Adaptation

1

$$F_1(x) = \frac{a_1}{1 + \left(\frac{x+a_2}{a_3}\right)^{-a_4}}$$

$$\approx c(x + a_2)^{a_4}$$

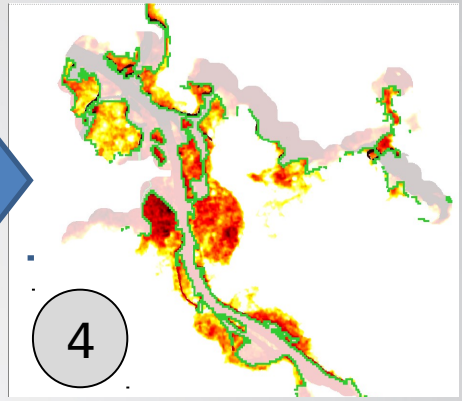




2

3

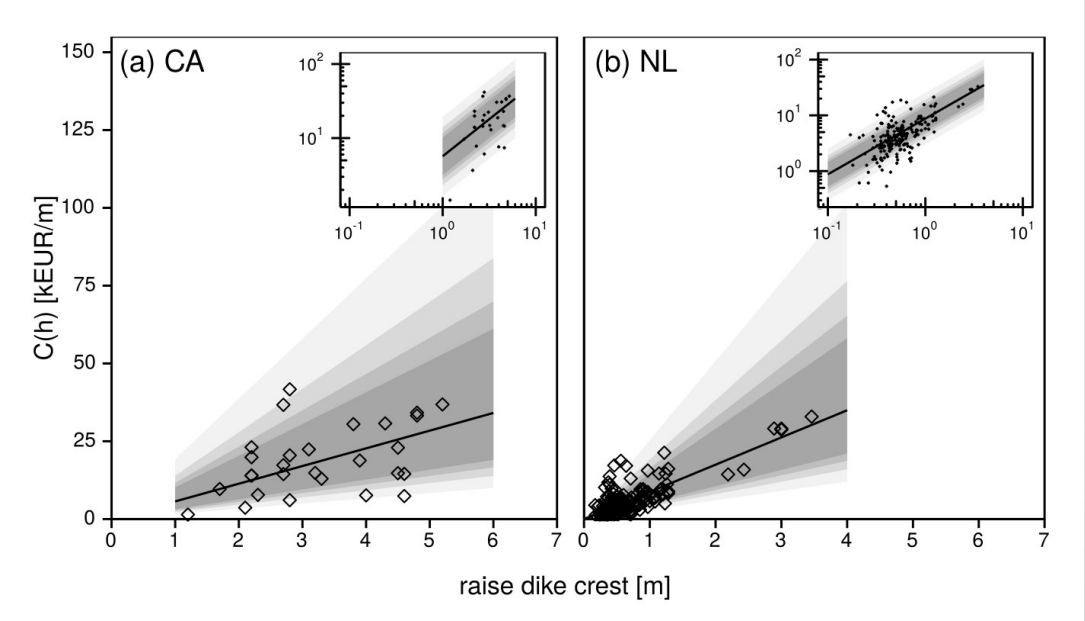
Example: Bilbao

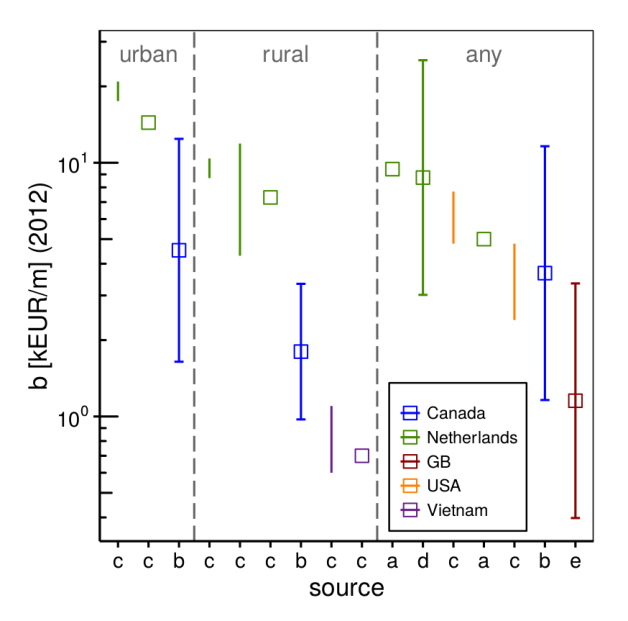


4

Boettle/Rybski/Costa/Kropp (2016) in prep

Protection costs



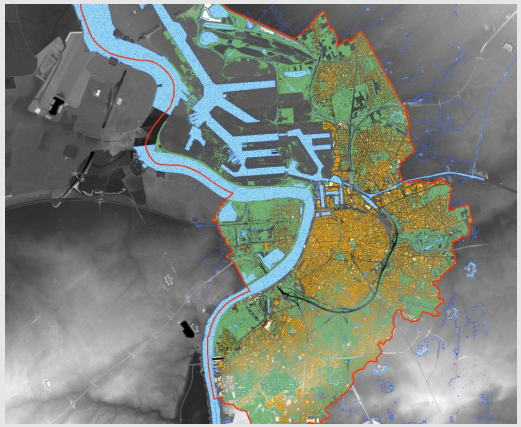


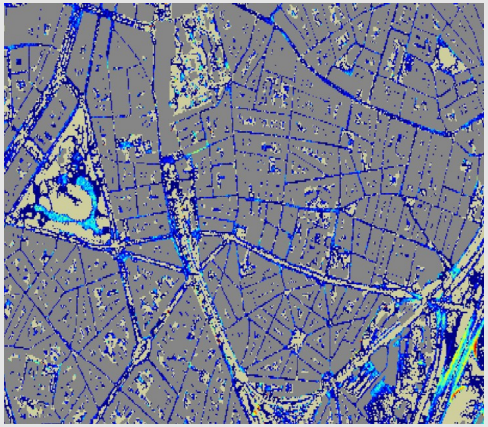
analogy to project cost overruns

uncertainty: 3*x … x/3 include 95%

“Costs of sea dikes – regressions and uncertainty estimates”
S. Lenk et al., nhessd, 2016

Detailed level urban climate risk

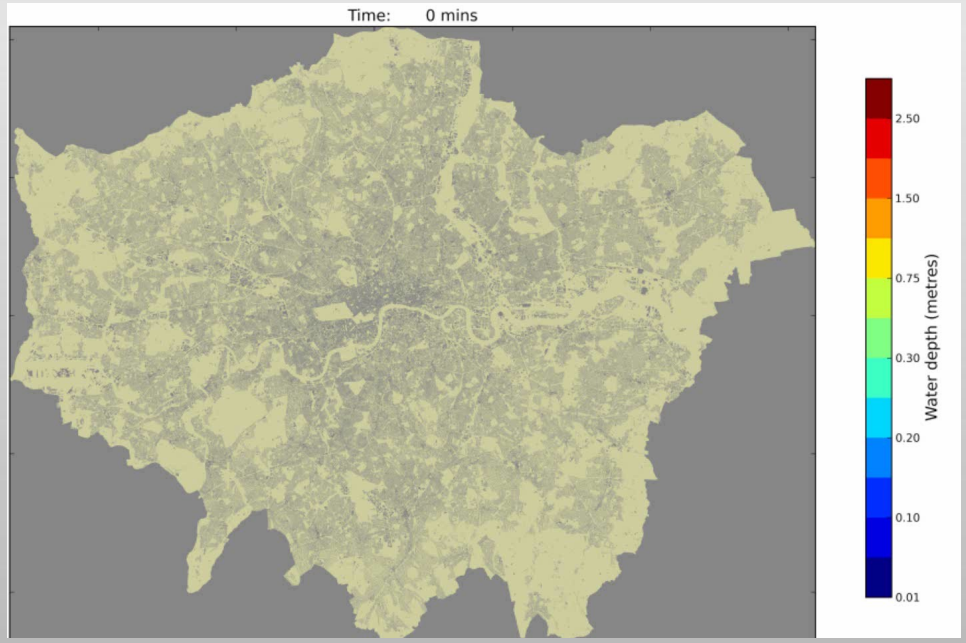




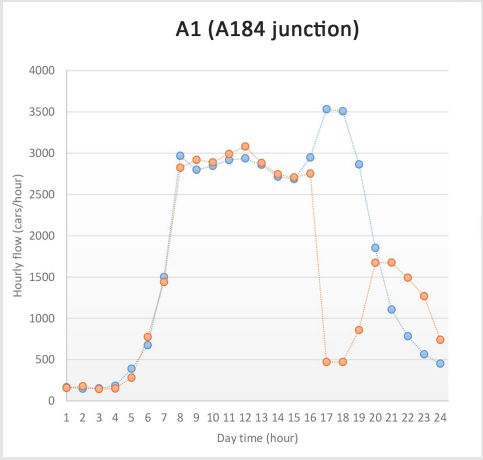
High resolution pluvial flood modelling

- 1m in Antwerp
- 4m (1600km^2) in London
- Integrated surface-sewer flows
- Current, future rainfalls
- Test blue/green strategies

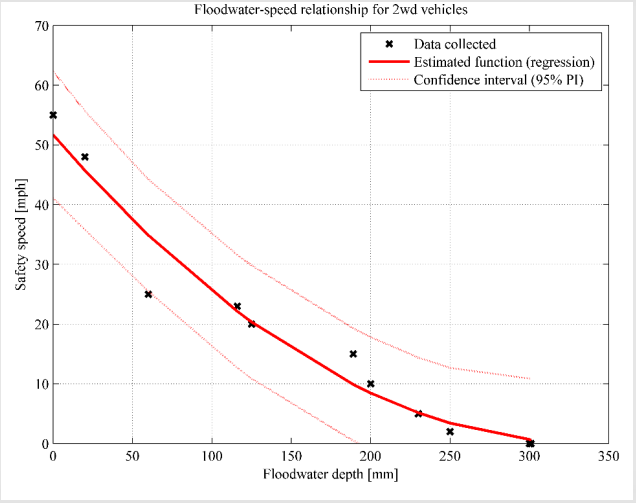
Initial results for Antwerp included in climate adaptation report to city aldermen and mayor



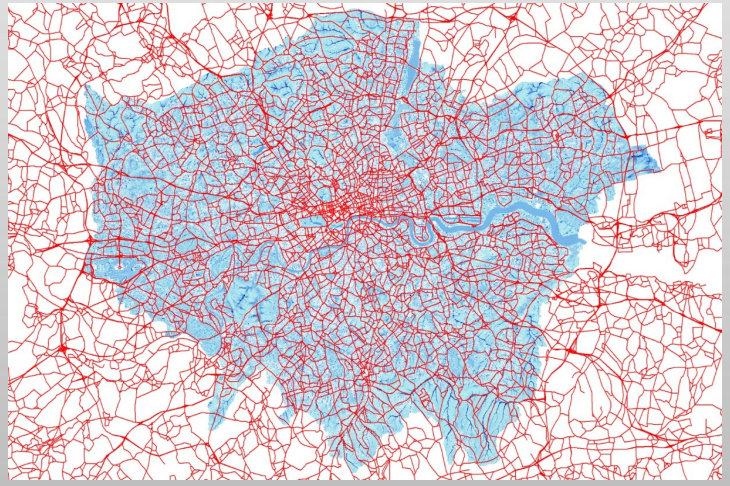
Detailed level urban climate risk



Traffic flow sensors
•Blue = normal day
•Orange = flood day



- New function: depth vs. vehicle speed
- Empirical observations (traffic sensors, videos etc.)
- Theoretical analysis (e.g. aquaplaning speeds)

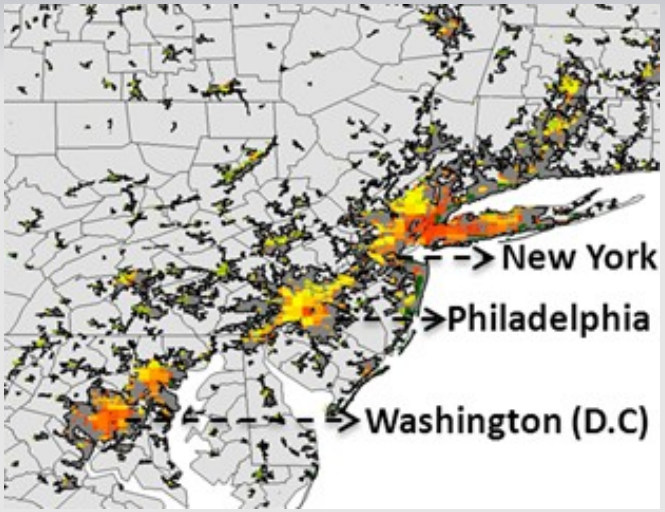


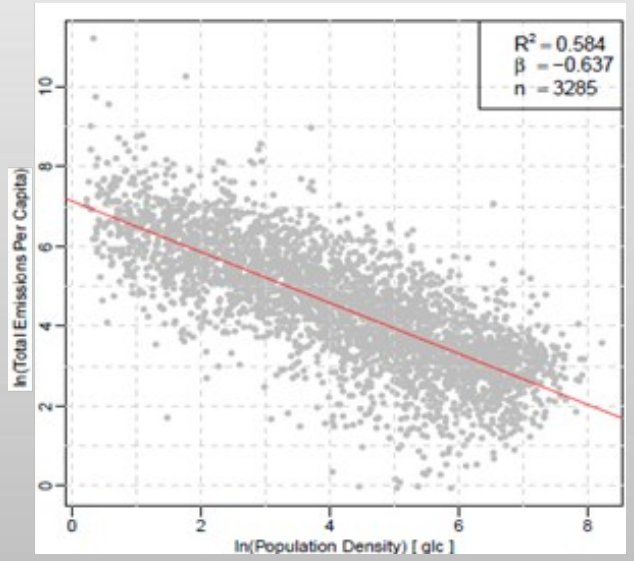
- Link surface water flood model to land use and transport model
- Assess disruption to car and public transport
- Calculate costs of disruption and adaptation options
- Explore climate and land use scenarios

City Emissions

Problem: emperical data often unsuitable

Compromise is necessary





Emission has a decaying power-law relationship to city density (population/area)

Valid for housing emissions (depending on the climatic zone)

Holds overall for transport emissions

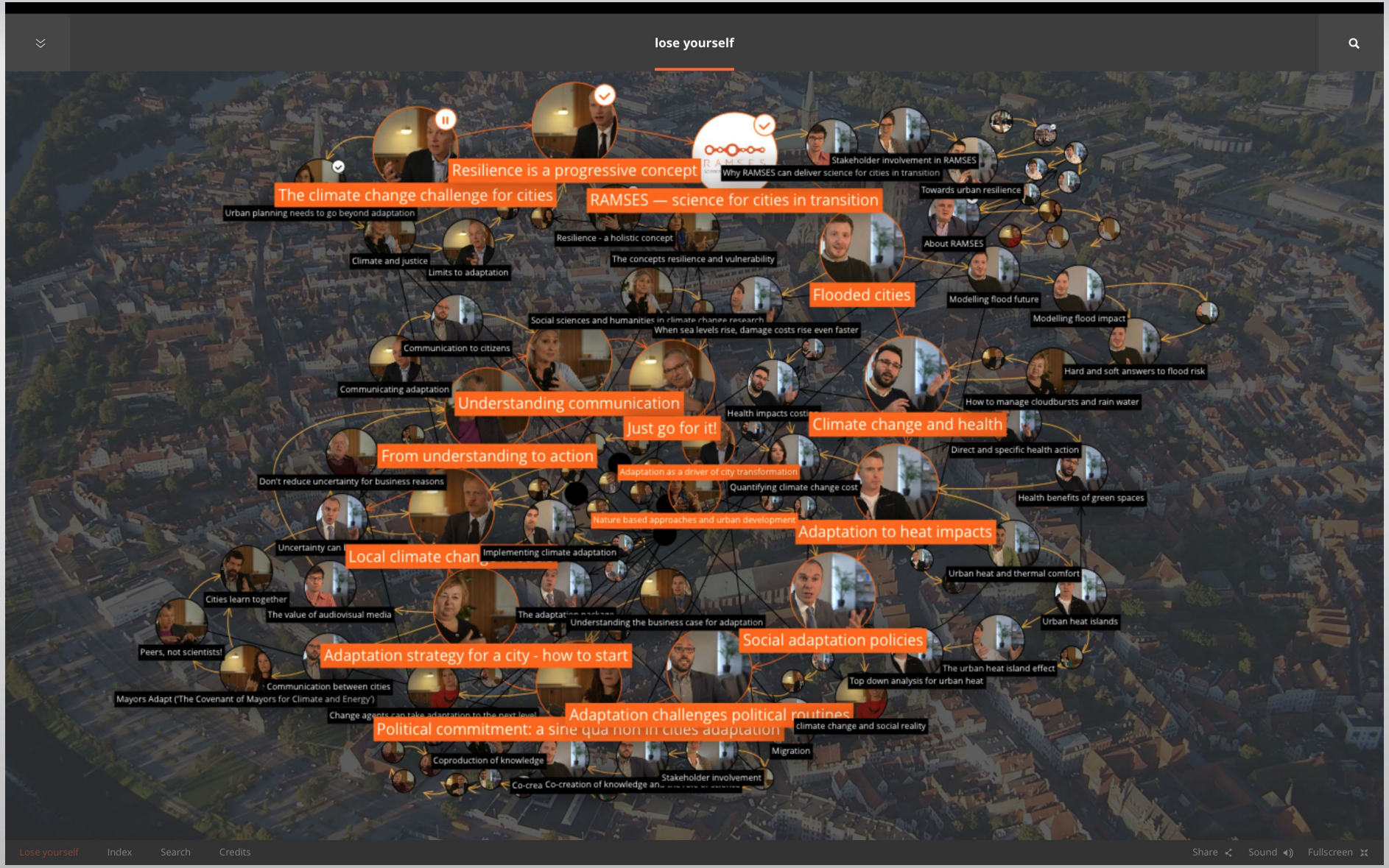
Production oriented emissions not yet covered

Toolbox / Audio-visual guidance

Toolbox will consist of
a Transition Handbook (TECNALIA)
a Training Package & Training Events (ICLEI) focus on the health tool
an audio-visual guidance web application

CMF already conducted and filmed more than 20 interviews with adaptation experts and local practitioners.

WP10 team created prototype of the application architecture.


lose yourself
Resilience is a progressive concept
The climate change challenge for cities
RAMSES — science for cities in transition
Why RAMSES can deliver science for cities in transition
Stakeholder involvement in RAMSES
Towards urban resilience
About RAMSES
Urban planning needs to go beyond adaptation
Climate and justice
Limits to adaptation
Resilience - a holistic concept
The concepts resilience and vulnerability
Flooded cities
Modelling flood future
Modelling flood impact
Social sciences and humanities in climate change research
When sea levels rise, damage costs rise even faster
Communication to citizens
Communicating adaptation
Understanding communication
Hard and soft answers to flood risk
How to manage cloudbursts and rain water
Health impacts cost
Just go for it!
Climate change and health
From understanding to action
Direct and specific health action
Adaptation as a driver of city transformation
Don't reduce uncertainty for business reasons
Quantifying climate change cost
Health benefits of green spaces
Nature based approaches and urban development
Adaptation to heat impacts
Uncertainty can b
Local climate chan
Implementing climate adaptation
Urban heat and thermal comfort
Cities learn together
The value of audiovisual media
Understanding the business case for adaptation
Urban heat islands
Social adaptation policies
Peers, not scientists!
Adaptation strategy for a city - how to start
The urban heat island effect
Top down analysis for urban heat
Communication between cities
Mayors Adapt ('The Covenant of Mayors for Climate and Energy')
Adaptation challenges political routines
Political commitment: a sine qua non in cities adaptation
climate change and social reality
Migration
Coproduction of knowledge
Stakeholder involvement
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Co-creation of knowledge an
Lose yourself
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RAMSES

12 Results for: RAMSES

RAMSES — science for cities in transition 01:57

#European Union #European Commission #science #FP7 #RAMSES #research #mitigation #adaptation #cities

RAMSES is a European research project focusing on cities that quantifies impacts of climate change and the costs and benefits of adaptation measures to enables the design of adaptation strategies. This project has received funding from the European Union's Seventh Programme for Research, Technological Development and Demonstration under Grant Agreement No. 308497 (Project RAMSES).

Stakeholder involvement in RAMSES 01:19

#cities #city #stakeholder involvement #stakeholder dialogue #adaptation strategy #RAMSES #participation

Julia Peleikis: the role of stakeholder involvement in the RAMSES-Project

Impressions from the second RAMSES Stakeholder Dialogue 08:05

#health #RAMSES #adaptation #Stakeholder Dialogue #city #cities

The second RAMSES Stakeholder Dialogue in Copenhagen on May 11th 2015 gave participants the opportunity to share insights and discuss their experience i.e. about health related issues with key adaptation experts and stakeholders and with cities that are engaged in adaptation.

The RAMSES policy toolkit 01:52

#adaptation #policy #city #decision making #RAMSES

François Gemenne: which policy instruments work best for the partisan process of adaptation decision making

About RAMSES 07:47

#adaptation #best practice #climate science #transition #cities #case studies #climate #research #Europe #climate data #city #FP7 #European Commission #impact

RAMSES Stakeholder Dialogues

Aims: present and share research results, discuss with relevant stakeholders, obtain feedback and co-create further research outcomes

RAMSES policy briefs

Policy relevant summary of project scientific findings, e.g.

- damage costs assessment framework,
- the relationship between urban density and greenhouse gas emissions

RAMSES
Science for cities in transition

Contact us

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Duration: 1.11.2013-31.10.2017

The work leading to these results has received funding from the European Community's Seventh Framework Programme under Grant Agreement No. 308497 (Project RAMSES - Reconciling Adaptation, Mitigation and Sustainable Development for Cities).