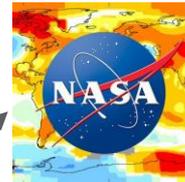


# C40 – WHO ARE WE?



# THE FUTURE WE DON'T WANT



**ACCLIMATISE**  
building climate resilience

# THE FUTURE WE DON'T WANT - CONTENT

- **ESTIMATED URBAN VULNERABILITY TO CLIMATE CHANGE ACROSS SIX AREAS**
- **HOW MANY URBAN RESIDENTS ARE AT RISK, FROM A VARIETY OF CLIMATE HAZARDS, IN 2050?**

Heat Extremes



Water Availability



Sea Level Rise



Food Supply



Equity and Environmental Justice



Energy Vulnerability



# INPUTS

- **URBAN POPULATION BASE MAPS**
  - CURRENT POPULATION
  - PROJECTED FUTURE POPULATION

... ARE OVERLAYED WITH...

- **CLIMATE BASE MAPS**
  - CURRENT CLIMATE
  - CLIMATE CHANGE PROJECTIONS (NASA NEX)
  - CLIMATE PROJECTIONS (RCP 8.5)

... AND

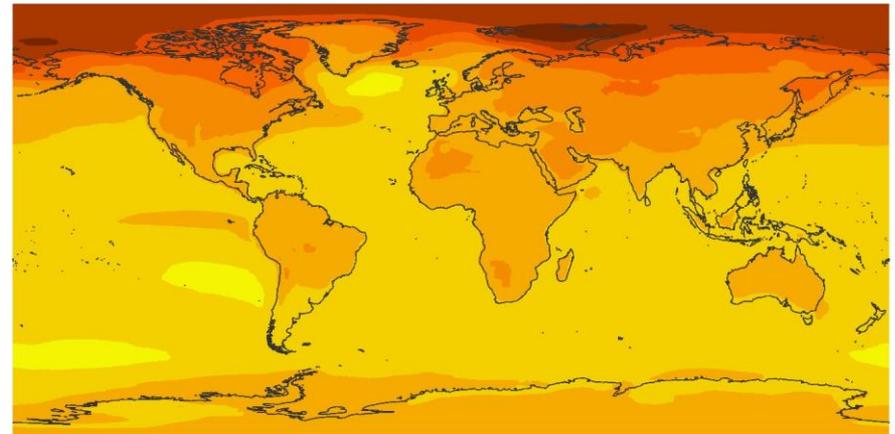
- **GLOBAL DATABASES RELATED TO HAZARDS**

**TO GENERATE IMPACT NUMBERS FOR CITIES  
OVER 100,000 PEOPLE**

## Temperature Base Map

RCP 4.5

Climate Change (2050s)



Temperature Change (°C)



Note: Colors represent mean annual temperature change for a mid-range scenario (RCP 4.5) from CMIP5 models (2040-2069 average minus 1971-2000 average).

# KEY FINDINGS

Vulnerability	Time Period	Population Estimate	City Estimate
EXTREME HEAT	Present Day	Over 200 million people	Over 350 cities
	2050s	Over 1.6 billion people	Over 970 cities
EXTREME HEAT AND POVERTY	Present Day	Over 26 million people	Over 230 cities
	2050s	Nearly 215 million people	Over 490 cities
WATER AVAILABILITY	2050s	Over 650 million people	Over 500 cities
FOOD SECURITY	2050s	Over 2.5 billion people	Over 1,600 cities
SEA LEVEL RISE	2050s	Over 800 million people	Over 570 cities
SEA LEVEL RISE AND POWER PLANTS	2050s	Over 450 million people	Over 230 cities

# C40'S EARTH OBSERVATION AIMS

“

People say that if you find water rising up to your ankle, that's the time to do something about it, not when it's around your neck.

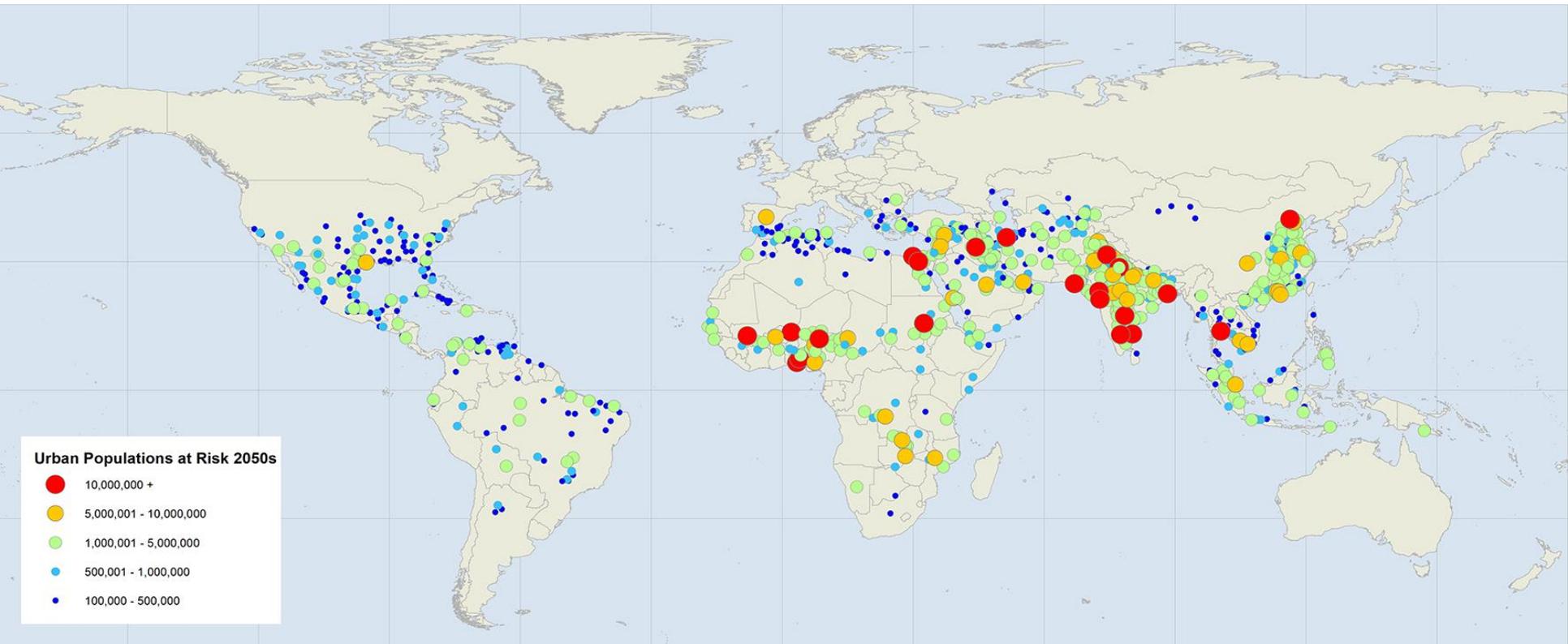
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PS

Chinua Achebe  
*Nigerian author*

- 1. MAKING THE POLITICAL CASE FOR  
AMBITIOUS MITIGATION ACTION**
- 2. INFORM ADAPTATION PLANNING**

# 1. MAPPING TO MAKE THE CASE FOR ACTION



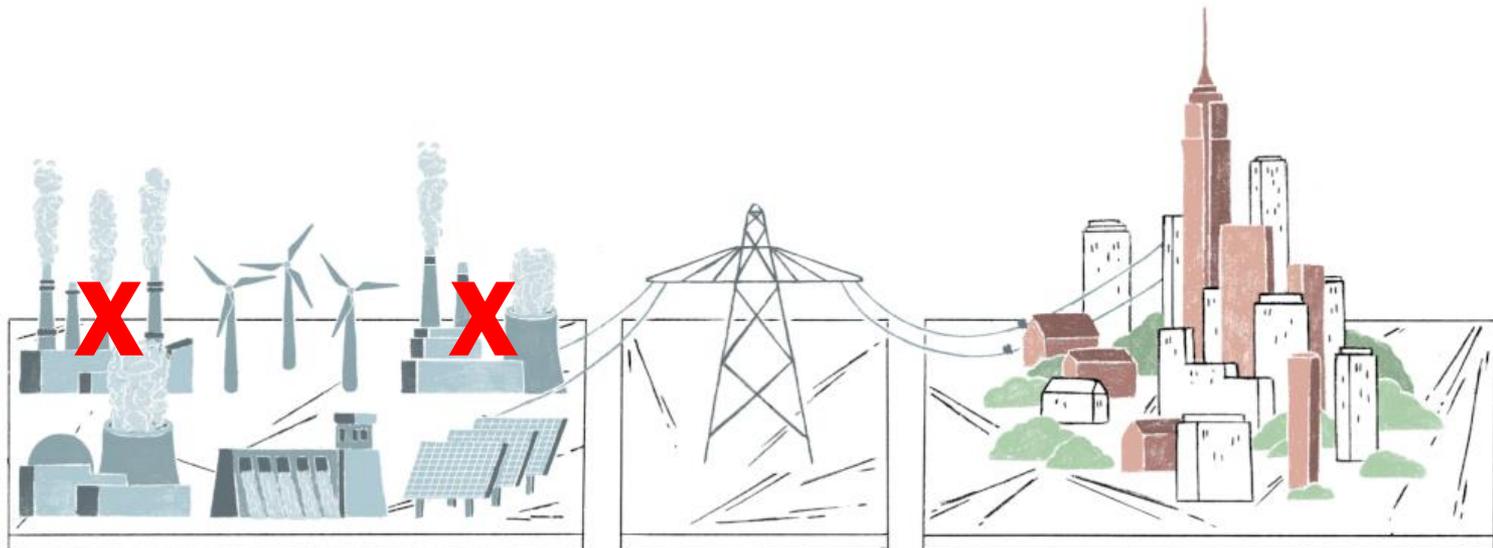
- **EARTH OBSERVATIONS ARE NOT DIRECT INPUTS INTO THE POLICYMAKING PROCESS**
- **LOWER SPATIAL RESOLUTION IS SUFFICIENT**

# FUTURE POTENTIAL IMPACT: FLOODING

COPERNICUS



## POLICY RESPONSE

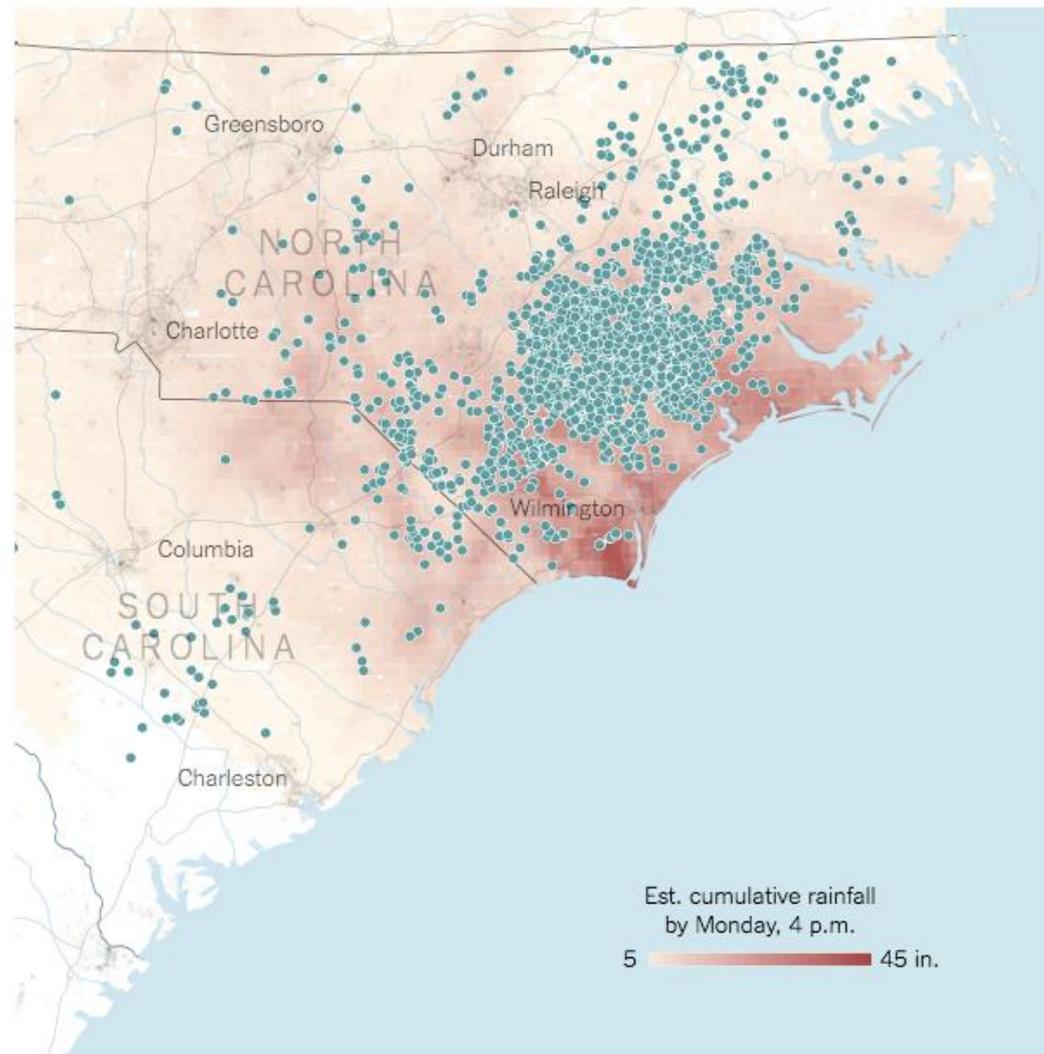


# MAPPING TO MAKE THE CASE FOR ACTION

## CASCADING IMPACTS AND DIFFERENTIATED VULNERABILITIES

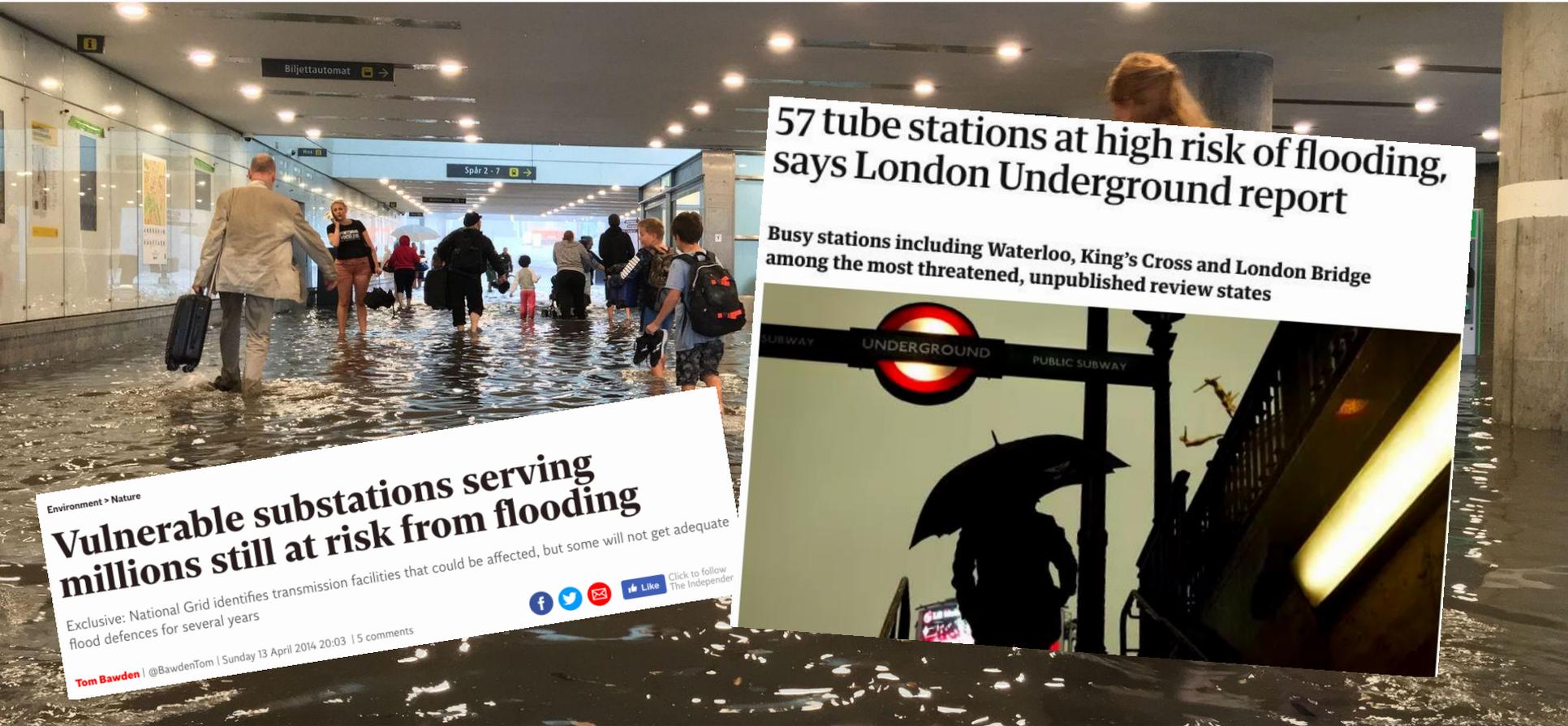
- **CASCADING IMPACTS**

### Pig farms



Sources: North Carolina Department of Environmental Quality; South Carolina Department of Health and Environmental

# MAPPING TO MAKE THE CASE FOR ACTION



**57 tube stations at high risk of flooding, says London Underground report**

Busy stations including Waterloo, King's Cross and London Bridge among the most threatened, unpublished review states

Environment > Nature  
**Vulnerable substations serving millions still at risk from flooding**

Exclusive: National Grid identifies transmission facilities that could be affected, but some will not get adequate flood defences for several years

[f](#) [t](#) [e](#) [Like](#) Click to follow The Independent

Tom Bawden | @BawdenTom | Sunday 13 April 2014 20:03 | 5 comments

**HIGHLIGHT INTERDEPENDENCIES BETWEEN URBAN SYSTEMS**

# MAPPING TO MAKE THE CASE FOR ACTION

GLOBAL WARMING

## Grandmothers sue Switzerland in climate complaint

By swissinfo.ch and agencies

SCI & TECH Weather Environment

IN DEPTH: CLIMATE CHALLENGE

IN DEPTH: CARING FOR THE ELDERLY



## DIFFERENTIATED VULNERABILITIES

- **WHAT GROUPS, WHAT HAZARDS, WHAT LOCATIONS?**

# MAPPING TO MAKE THE CASE FOR ACTION

Heat Extremes



Food Supply



Water Availability



Equity and Environmental Justice



Sea Level Rise



Energy Vulnerability



**Low Emission Zone**

Country code

Reg. No.

NR: F 500.001

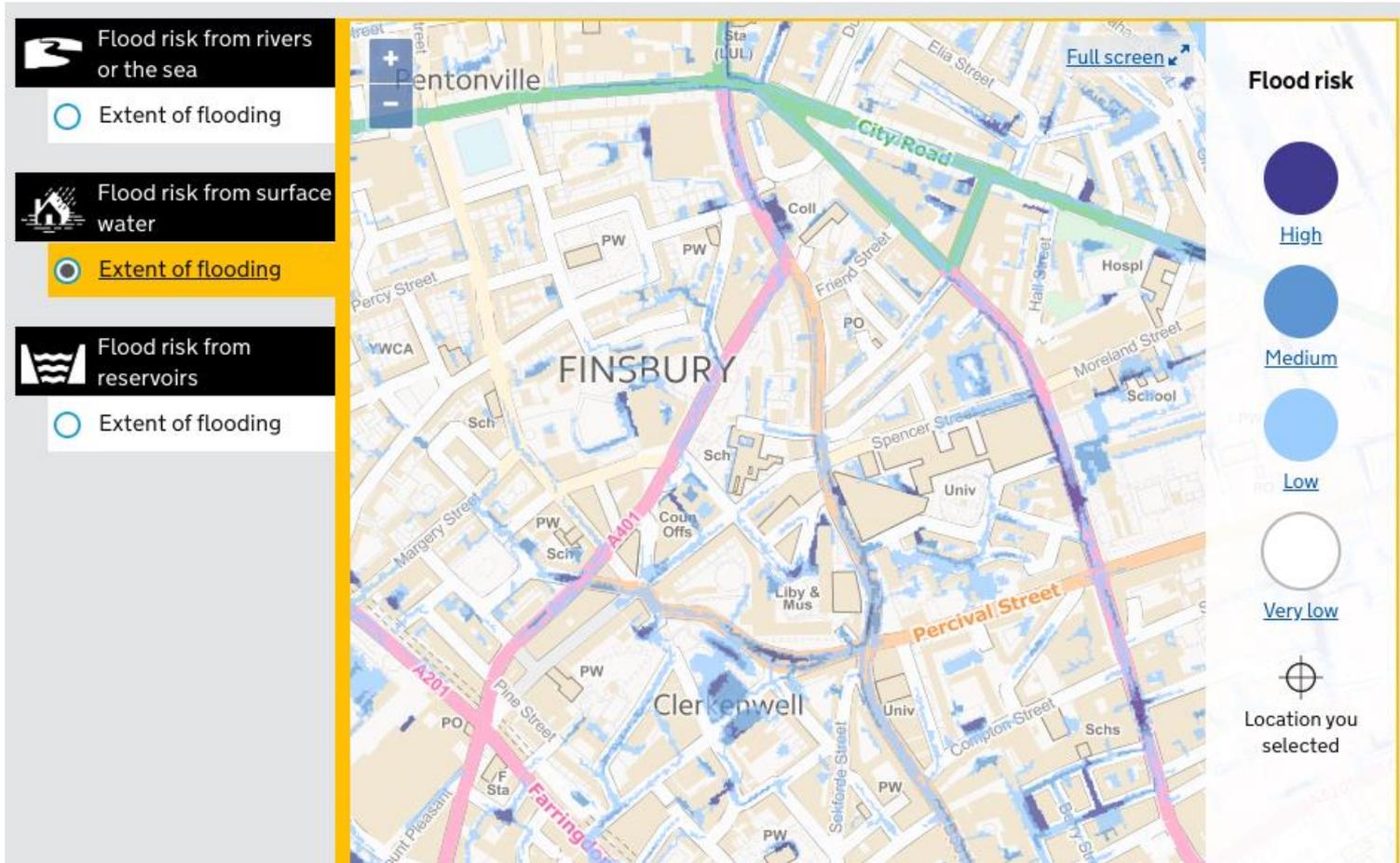
## 2. MAPPING TO INFORM ADAPTATION PLANNING

**HIGHER SPATIAL  
RESOLUTION NEEDED**

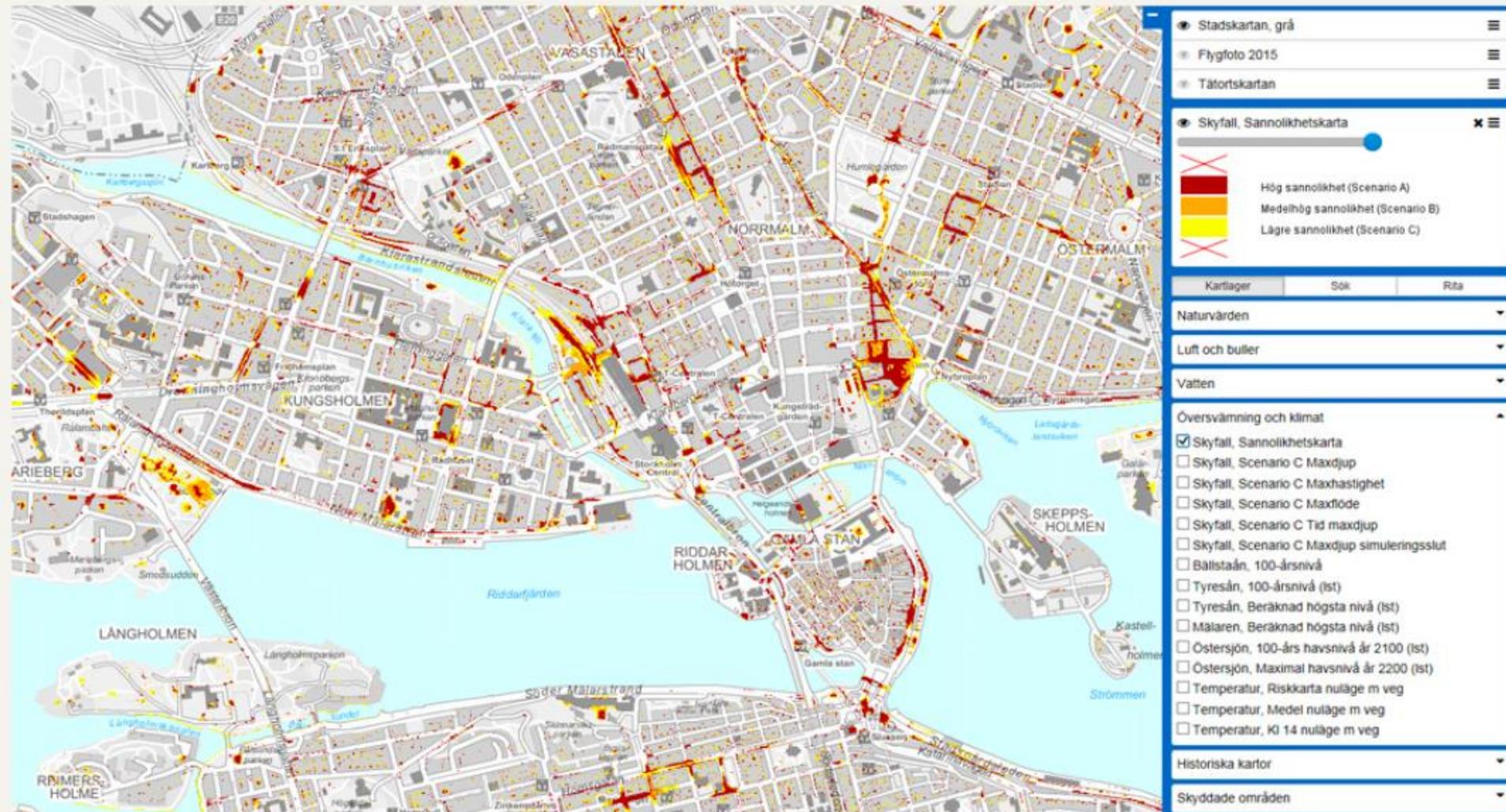
**VERY DIFFICULT TO  
SUPPLY THIS  
INFORMATION**



# MAPPING TO INFORM ADAPTATION PLANNING

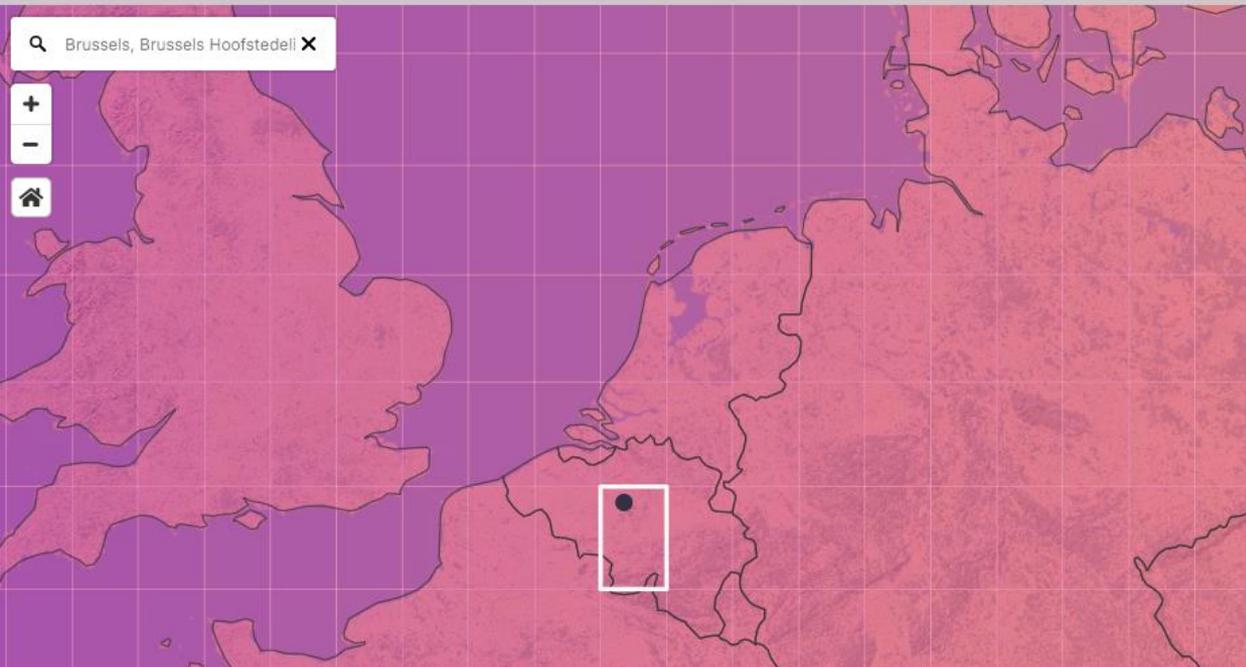


# MAPPING TO INFORM ADAPTATION PLANNING



Utsnitt ur skyfallsmodellens sannolikhetskarta, från miljöförvaltningens webbportal Miljödata.

# MAPPING TO PRIORITIZE

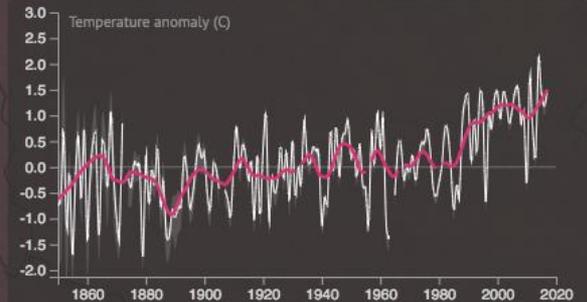


## Temperature change near Brussels, Brussels

*Belgium*

### Historic

This region has warmed by **1.3C** so far.



● Observed ● Smoothed average ● Uncertainty



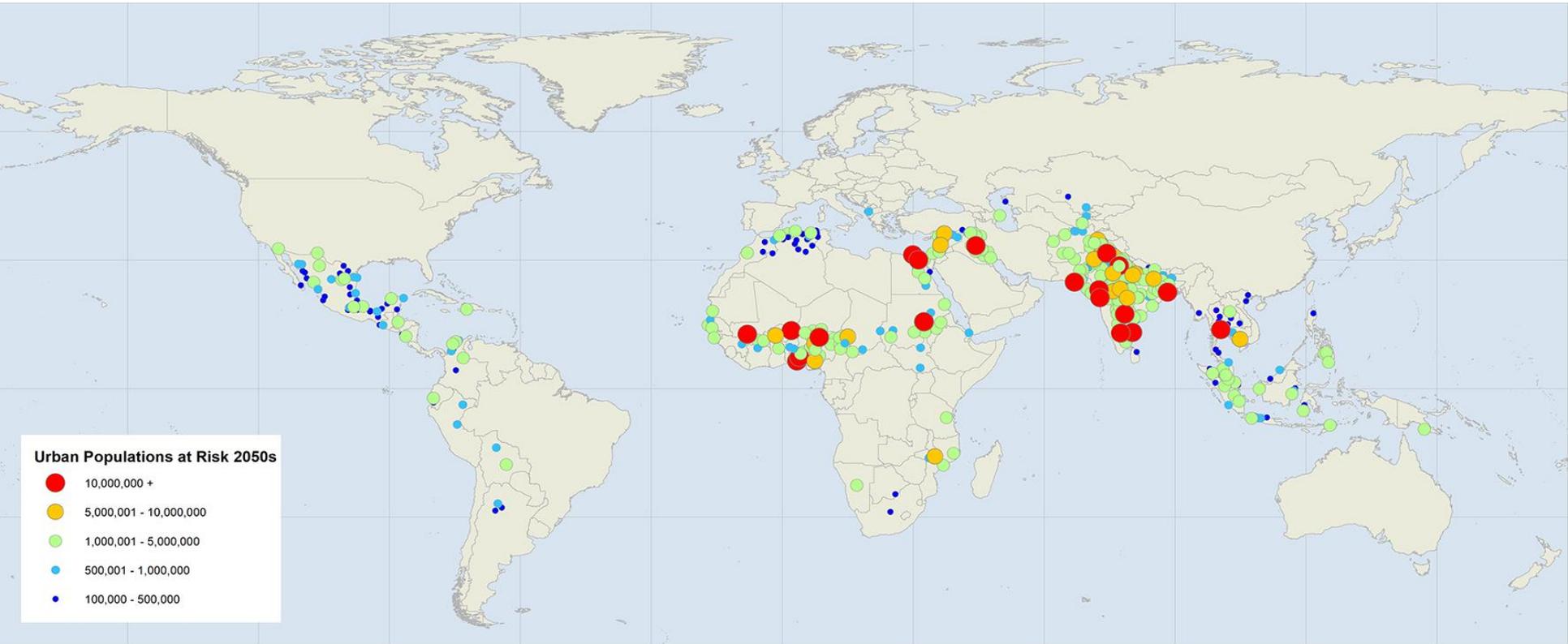
### Future

It is projected to warm by between **1.8C - 5C** by 2100.

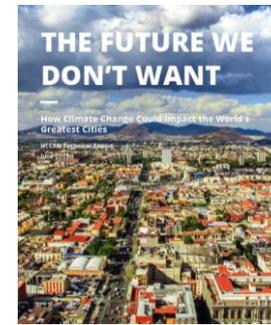
# MAPPING TO PRIORITIZE



# SUPPORTING THE REST OF THE WORLD



# MORE INFORMATION ON THE FUTURE WE DON'T WANT



Summary

- The number of cities exposed to extreme temperatures will nearly triple over the next decades. By 2050 more than 870 cities will experience average summertime temperature highs of 30°C (86°F). Today, only 304 cities are that hot.
- The urban population exposed to these high temperatures will increase by 800 percent to reach 3.6 billion by mid-century.
- Cities in countries that are less used to dealing with extreme heat are especially vulnerable. The 2009 heatwave in Europe led to 70,000 deaths.
- Extreme heat also pressures on essential services such as energy, transport, and health. During the 2008 heatwave India's hospitals received twice as many patients as usual.
- Heatwaves are an economic drain. They can cut goods and service outputs by more than 20 percent in sectors such as



Listen, below, to Dr Saleemul Huq, Director of the International Centre for Climate Change and Development (ICCCCD) speak about their work.

▶ The adaptation conversation  
**Impact2050: Dr Saleemul Huq: Equity and migration in Bangladesh**

▶ 02 / 2:56

## 01. GLOBAL FIGURES

Impacts. Access the technical report [here](#).

## 02. REGIONAL FIGURES

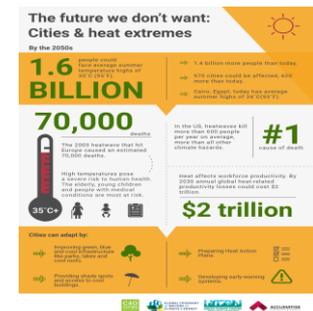
Impacts

## 03. NATIONAL FIGURES

Impacts

## 04. CITY CASE STUDIES

Impacts/Solutions



# Thank you

## CONTACT

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[www.c40.org](http://www.c40.org)

**C40  
CITIES**