

# Climate Change Adaptation in London



**Alex Nickson, Strategy Manager Climate Change Adaptation & Water, Greater London Authority**

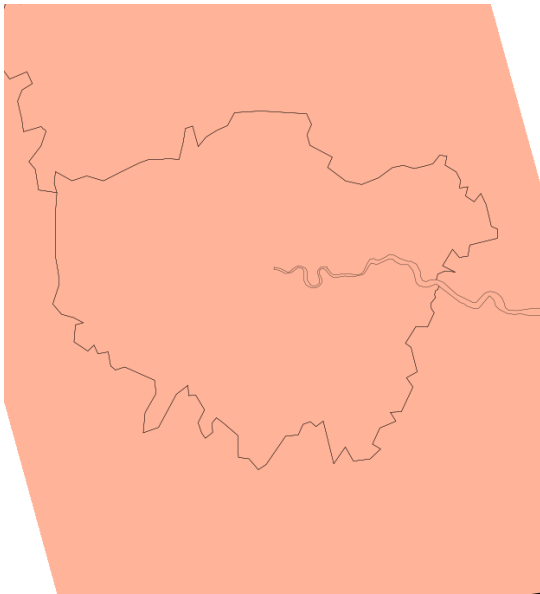
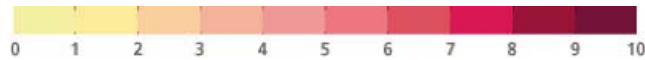
The comparative genetics of cities, 21<sup>st</sup> May 2010

# The London Climate Change Adaptation Strategy

We have taken a risk-based approach that :

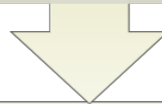
1. Assesses how London is vulnerable to weather-related risks today
2. Uses climate projections to understand how climate change accentuates existing risks or creates new risks / opportunities in the future
3. Identifies and tests risk management options
4. Provides a framework to
  1. Identify where the Mayor is uniquely placed to act
  2. Identify where other partners are best placed to act and how their actions can be facilitated or enhanced
  3. Identify where further work is required to understand the climate and / or impacts

# For summer average temperature, we see significant increases over the decades to 2080s



**But the temperature on the hottest day of the year could increase by up to 10°C**

2020s  
**+1.6°C**

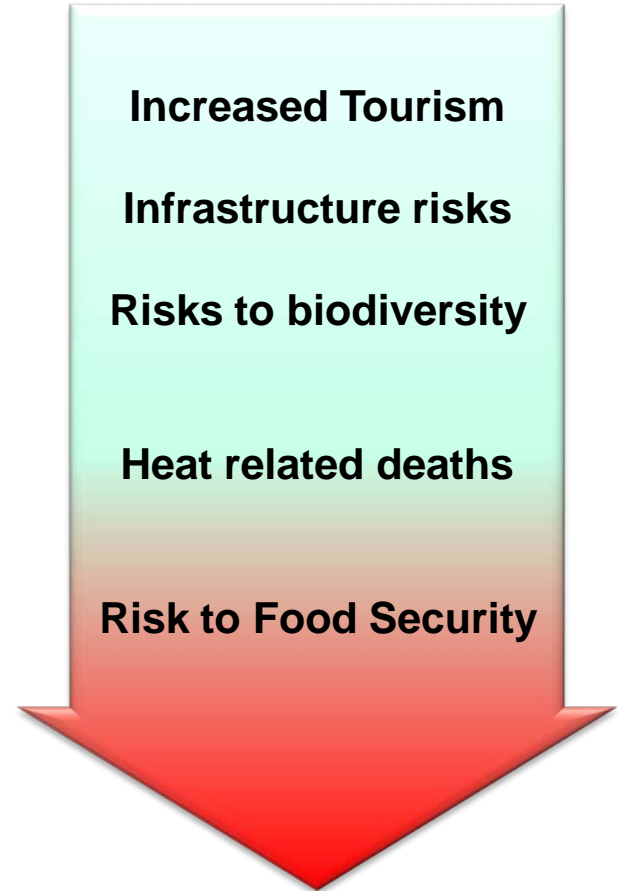


2050s  
**+2.7°C**



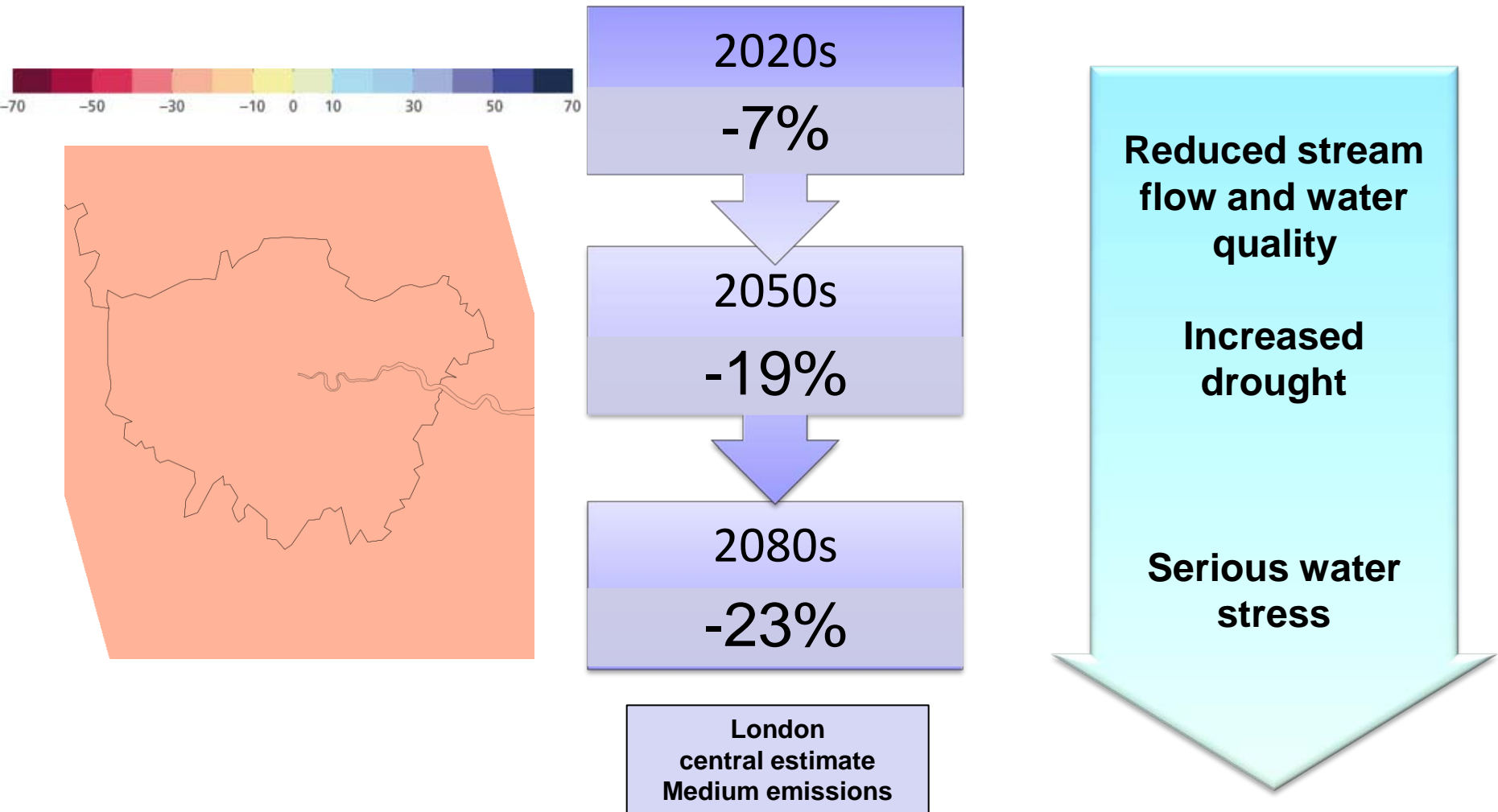
2080s  
**+3.9°C**

London  
central estimate  
Medium emissions



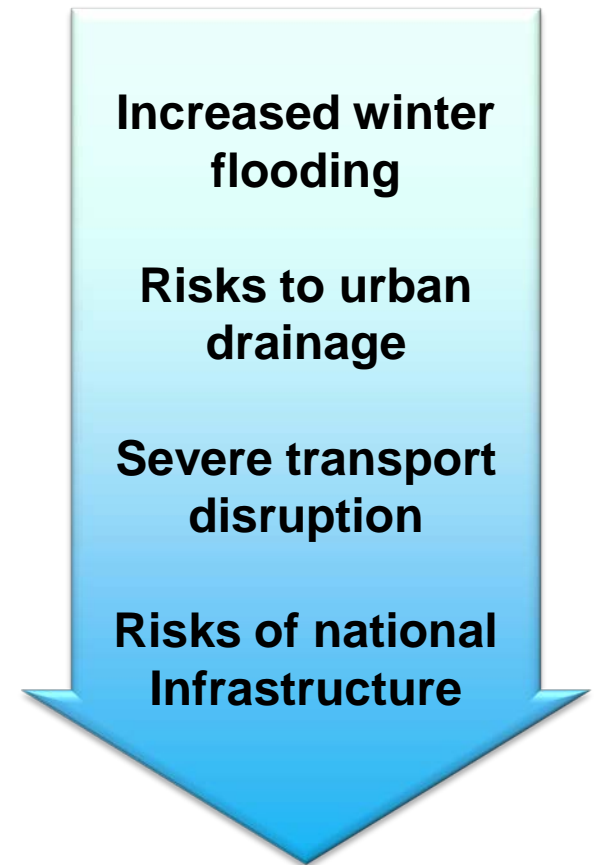
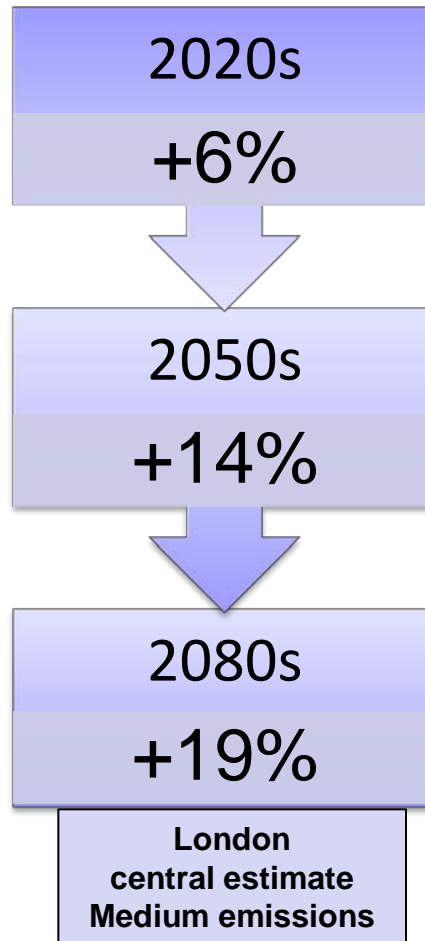
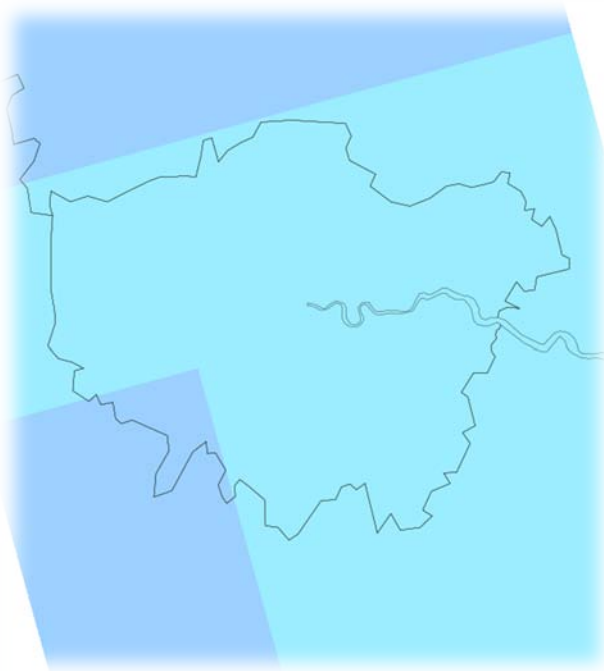
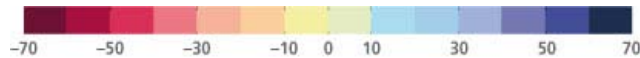
The change for the 2080s is very unlikely to be less than 2°C and very unlikely to be more than 6.4°C

# For rainfall we could see significant summer decreases



For the 2080s the change is very unlikely to be lower than -48% and very unlikely to be higher than +7%

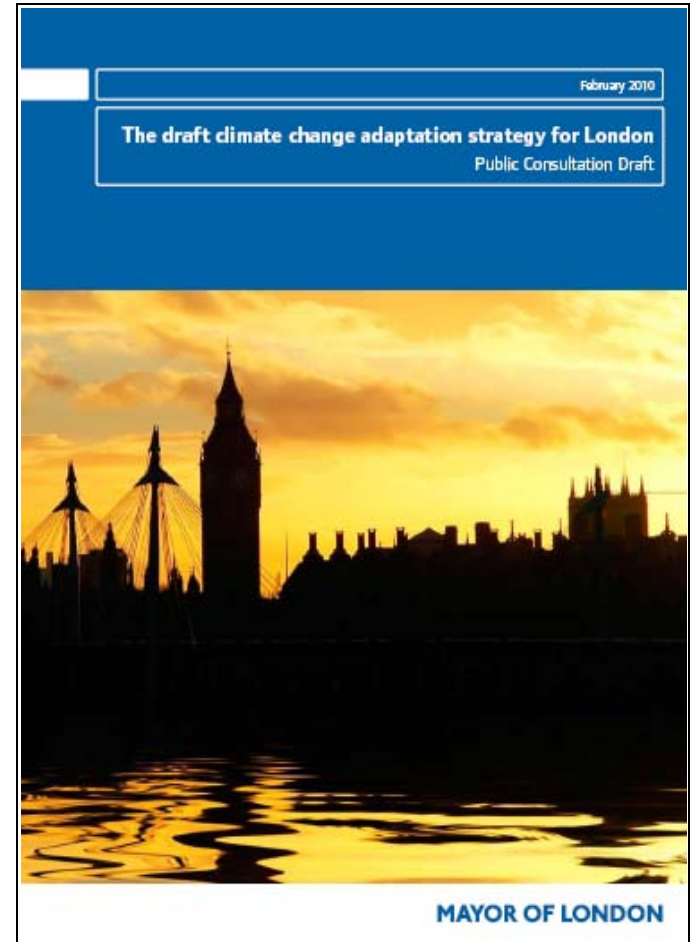
# For rainfall we see significant winter increases



For the 2080s the change is very unlikely to be lower than +3% and very unlikely to be higher than +44%

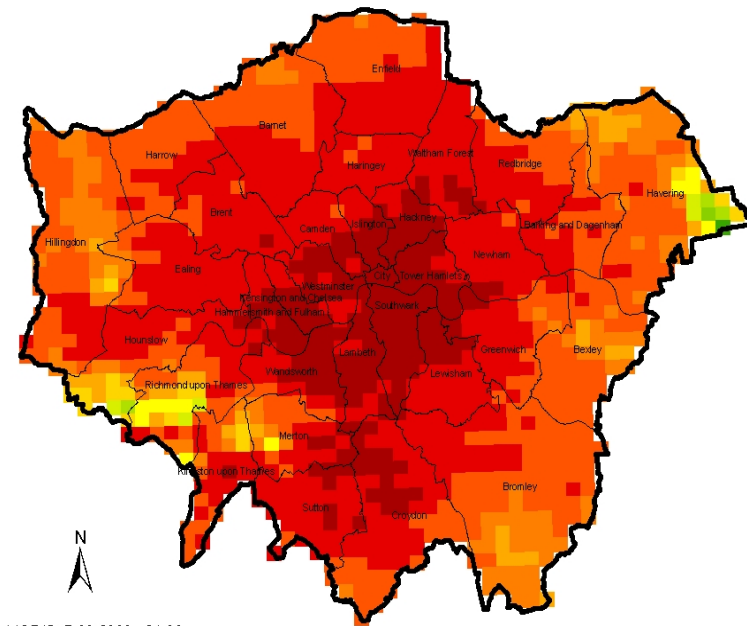
# How is London vulnerable to CC ?

- **Flooding**
- **Overheating**
- **Water resources**
- Air Quality
- Subsidence and heave
- Wind storms
- Global climate events

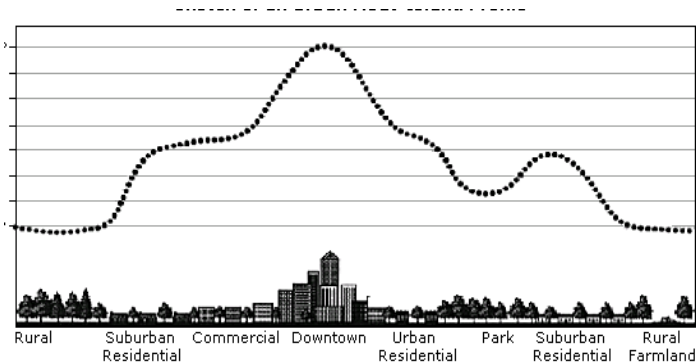


# The challenges - overheating

Temperature distribution in London, August 2003

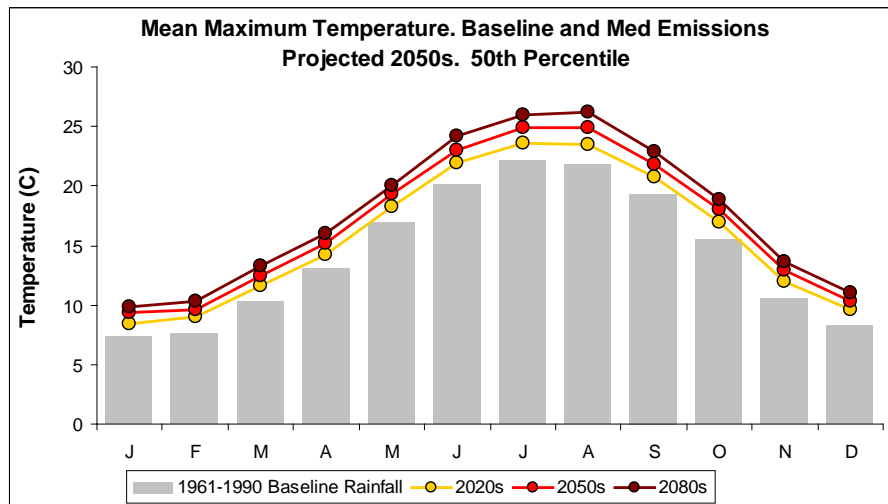
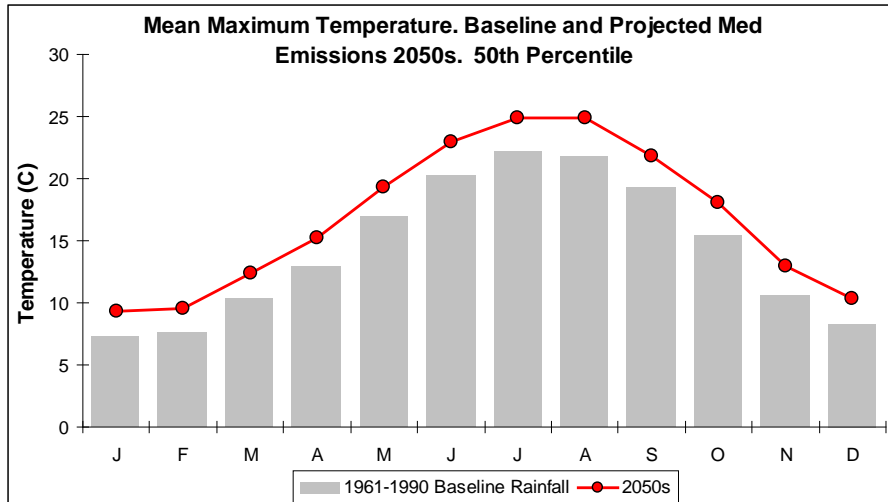


MODIS 7.08.2003 21:30



- 600 people died in the 2003 heatwave
- London's microclimate amplifies the impact of hot weather (London is up to 10°C warmer than the greenbelt on summer nights)
- Londoners are more resilient to rising temperatures than other UK regions, but suffer most when temperatures exceed 24 C.

# How will climate change increase risk of overheating ?



- Global-warming induced climate change
- Intensification of the urban heat island
  - More cloud free days
  - Drier summers
- BUT also :
- Man-made heat contributions in response to hotter temperatures
- Increase in density from London's growth

# The policy questions

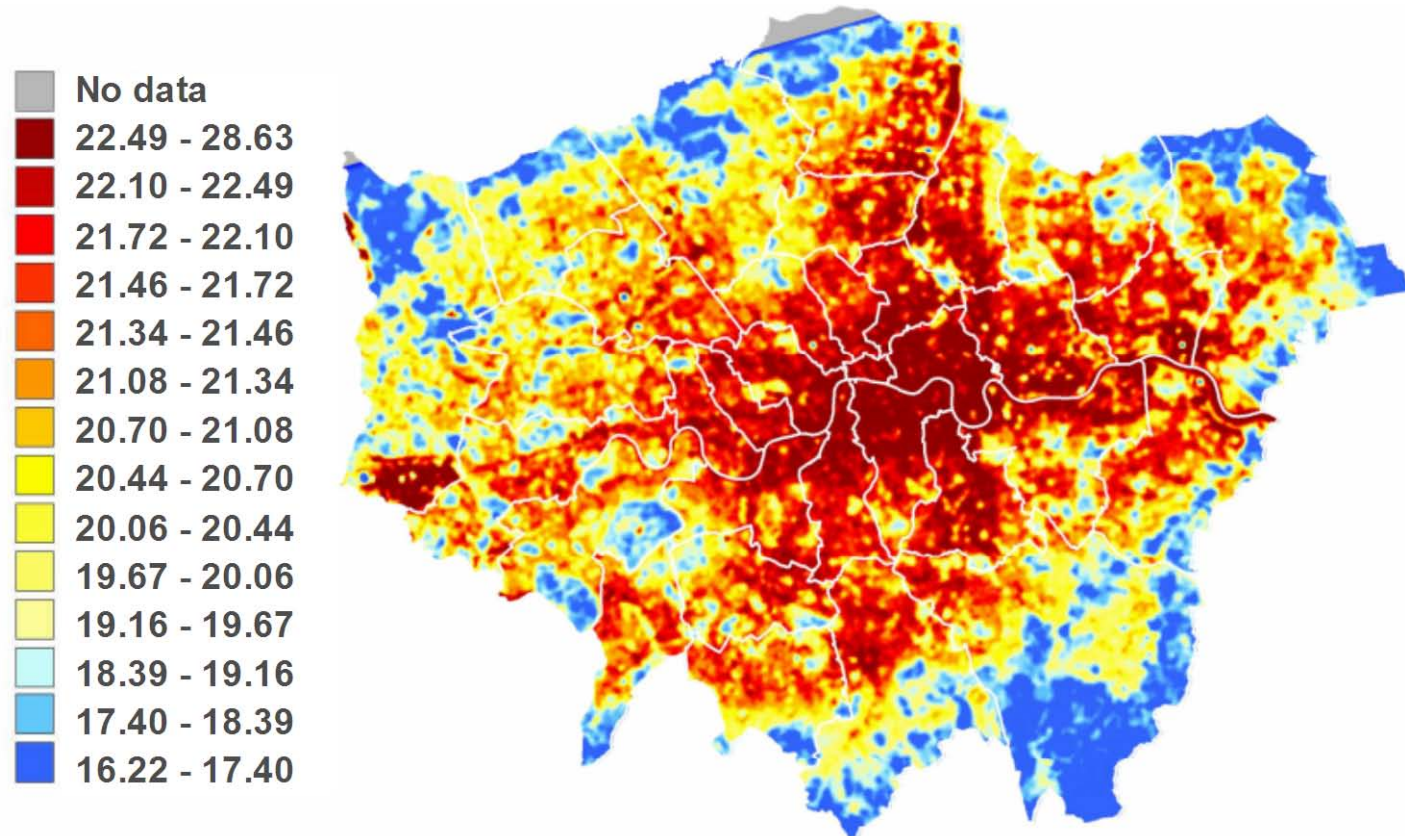
- How can London grow without increasing overheating risk ?
- What are the critical thresholds to rising temperatures
  - Health
  - Comfort
- What are the overheating management options (and the limits of their effectiveness) ?
- What are the critical interdependencies ?
  - Positive feedbacks
  - Energy security
  -

# Beating the Heat

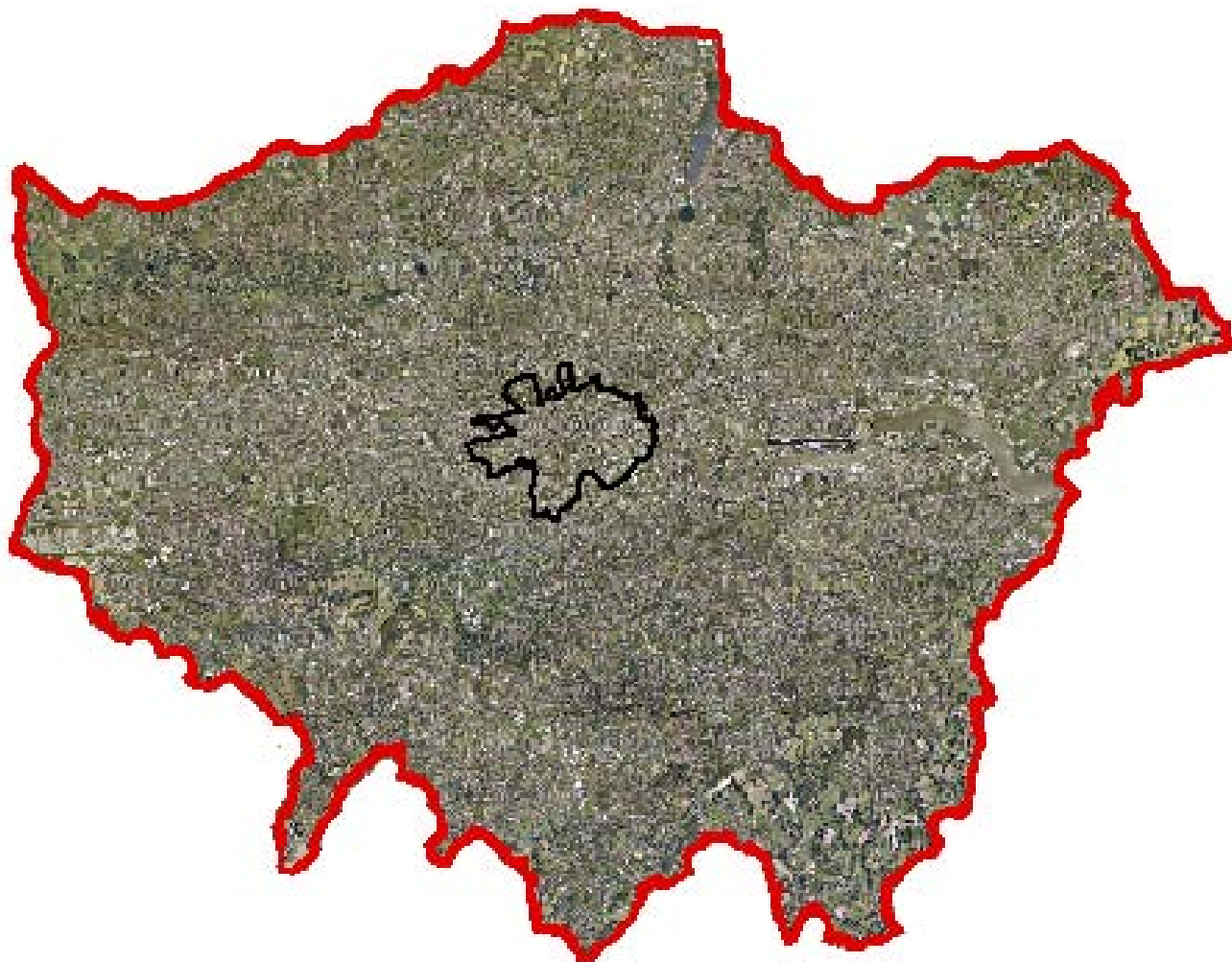
- Urban Greening programme
  - Increase tree cover across London by 5% by 2025
  - Increase green cover in the centre of London by 5% by 2030 and a further 5% by 2050
  - 100,000m<sup>2</sup> of green roofs by 2012
  - enhance 280ha of greenspace by 2012
- ‘Design summer year’ guidance for architects
- Create a network of weather stations across London
- Identify and promote heatwave refuges

# Design extreme summer year guidance

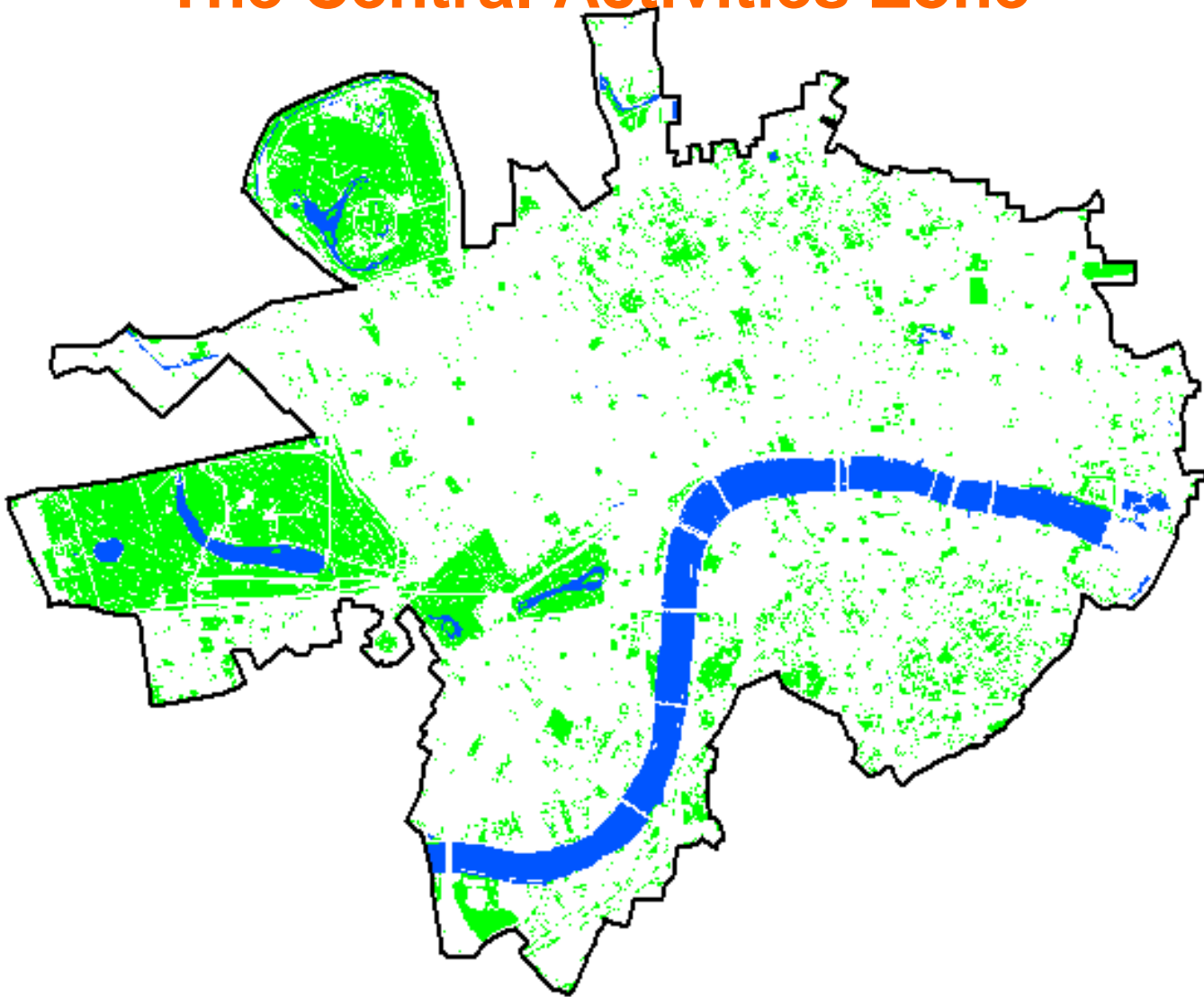
Hourly temperature projections for building simulation models taking account UHI and climate change



## Greater London – too grey?



## The Central Activities Zone



# When to adapt and how much to adapt to ?

Unacceptable

Tolerable

As low as  
reasonably  
possible



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- more people/property
- climate change
- ageing FD

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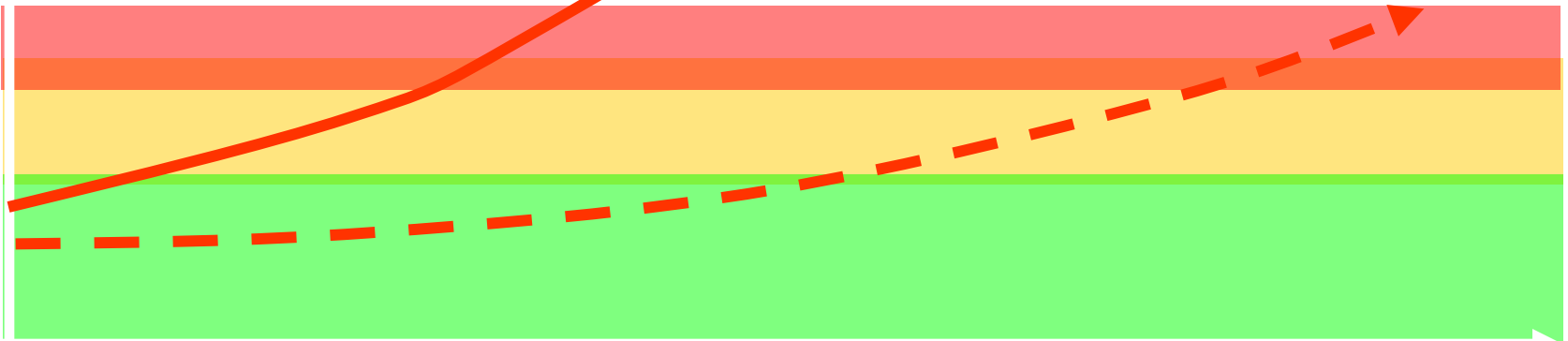
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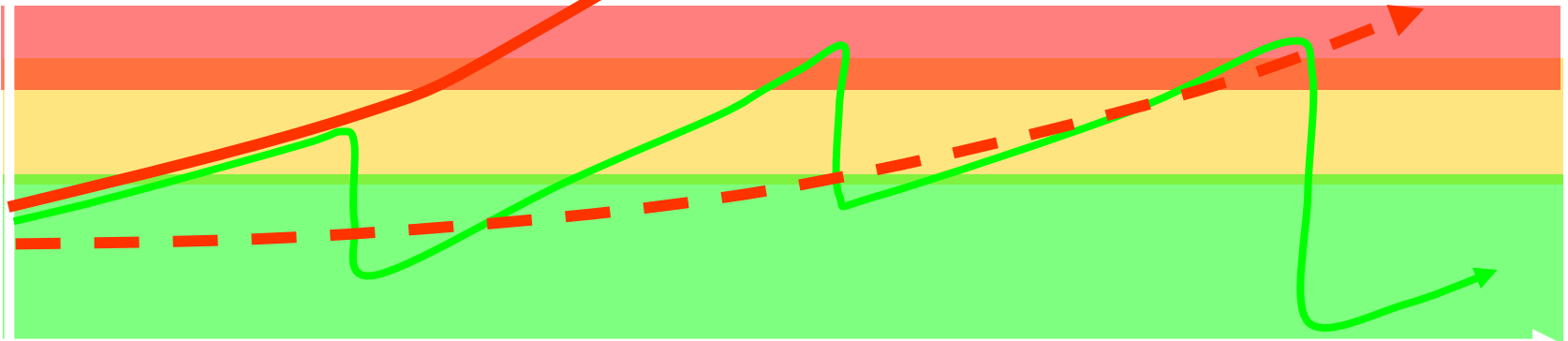
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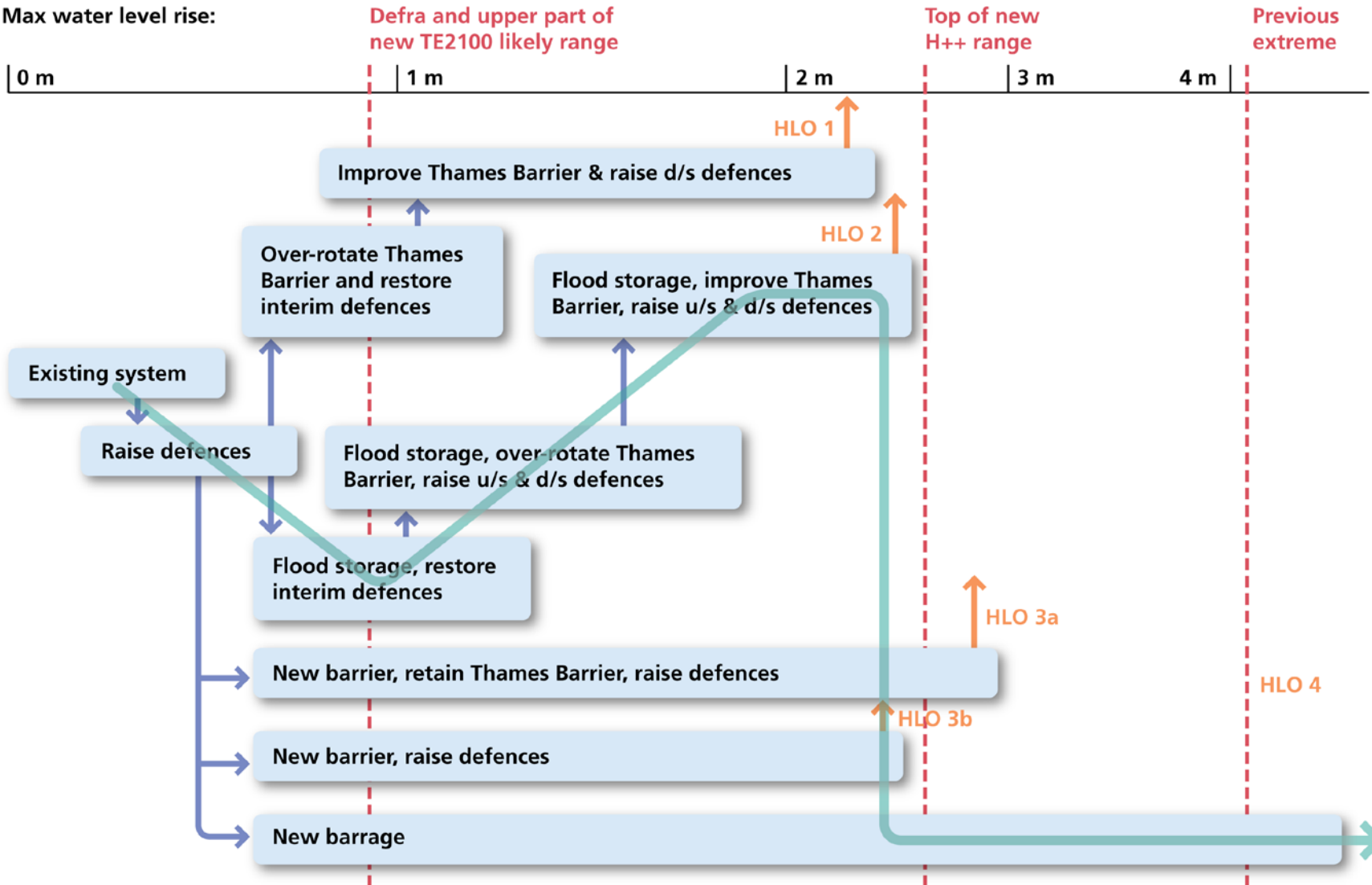
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# Thames Estuary 2100 : Adaptive pathways

Max water level rise:



**Key:** - - - Predicted max water level under each scenario  
 [Blue box] Measures for managing flood risk indicating effective range against water level

No days 2-day peak  $>24.7^{\circ}\text{C}$

3      6      9      12      15

10% Urban greening

30% urban greening

Combined Cooling Heat and Power

Open heatwave refuges

Heatwave emergency plan

**DIAGRAMMATIC ONLY : NOT MAYORAL POLICY !!!!!**

# Factoring in lead-in time

