Collingwood Environmental Planning

Climate Change Adaptation - Strategy and Integrated Appraisal in London

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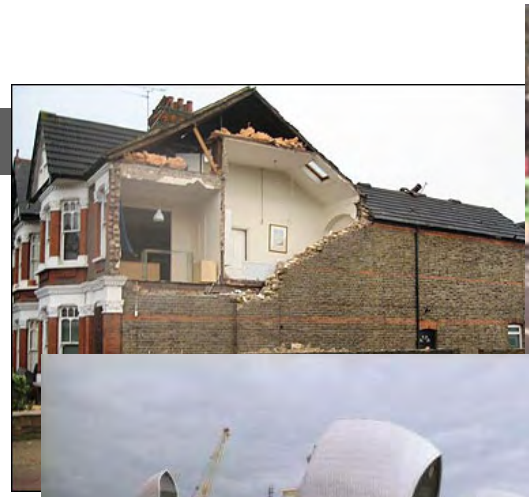
IAIA Ireland-UK Branch Meeting
University of Manchester
24 October 2007

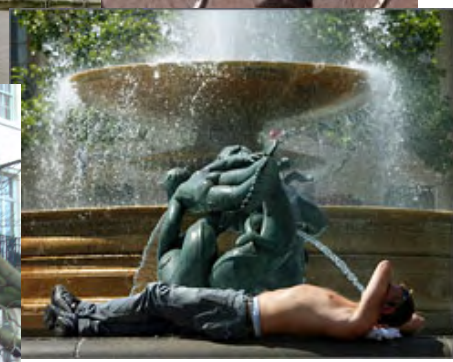
Overview

- What will be the effect of inevitable climate change on London?
- What can a Climate Change Adaptation Strategy (CCAS) do to help London adapt to climate change?
- What are the sustainability implications for London of climate change and adaptation?
- The SA process

How is London vulnerable to Climate Change ?

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

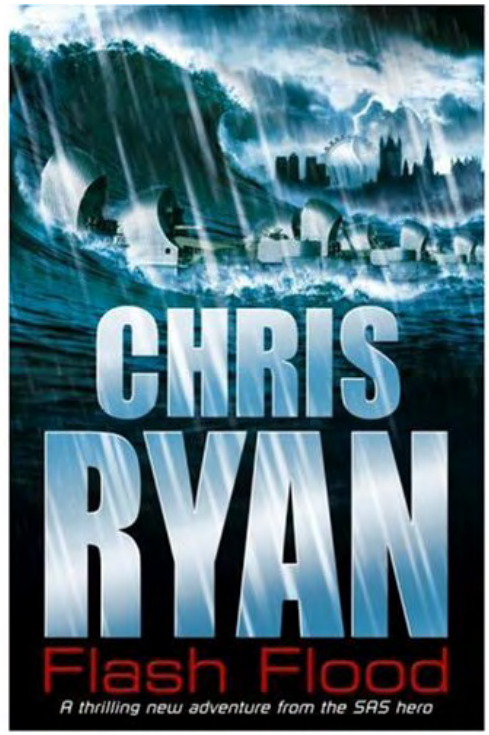


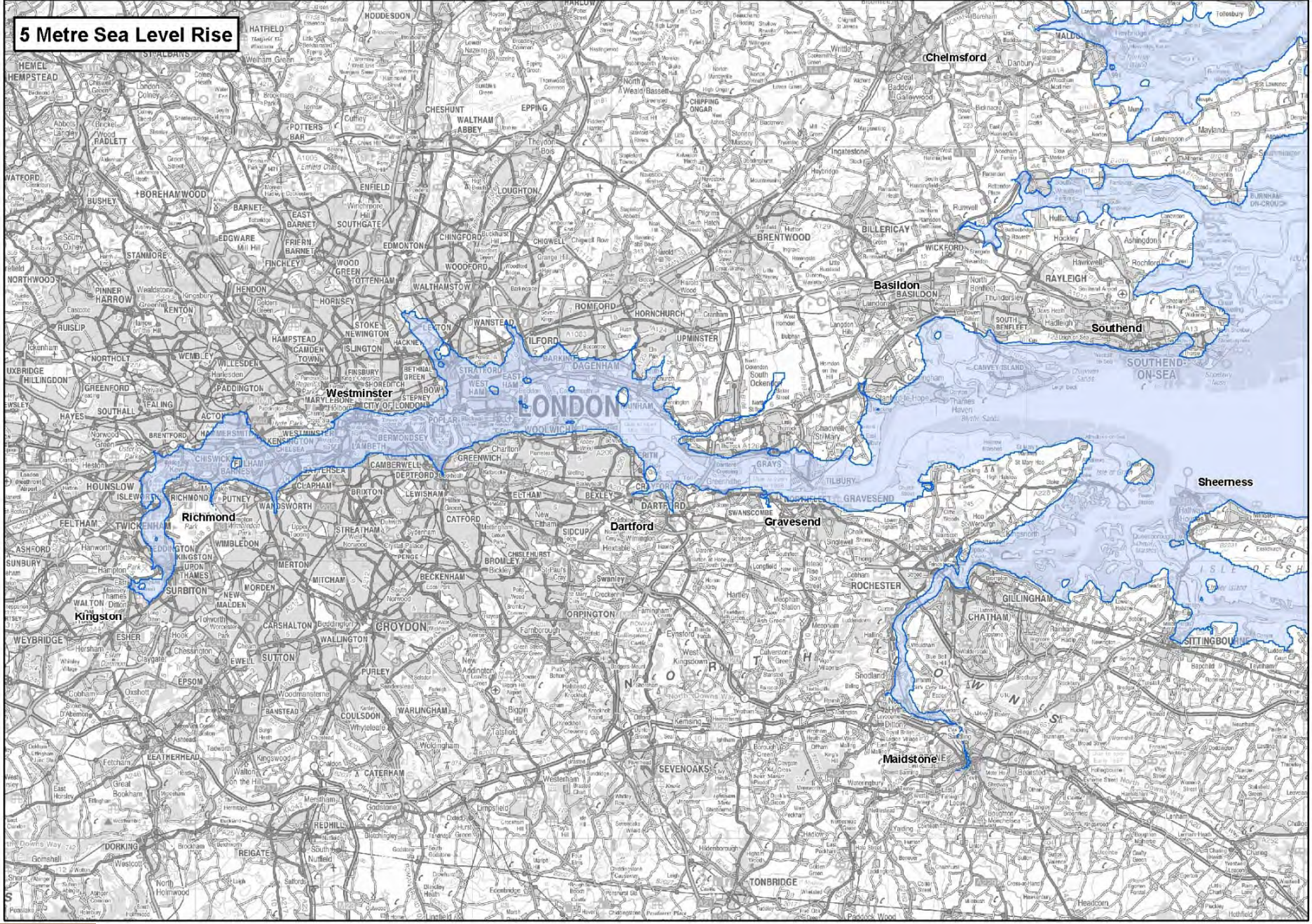


Wet in the City
(Flooding)

Four flood sources

- Tidal
- Fluvial
- Surface
- Sewer
- (Groundwater)
  - Frequently experience flooding from more than one source
  - Climate change will increase probability, London's growth may increase consequence





Area of London that would be flooded (shaded blue) if sea levels rose by 5m, assuming no increase in the standard of flood defence

Tube Stations in Flood Zone

DMAG
Data Management and Analysis Group

Flood Zone 3

GLA Boundary

Borough Boundary

75 tube stations in zone
291 in London

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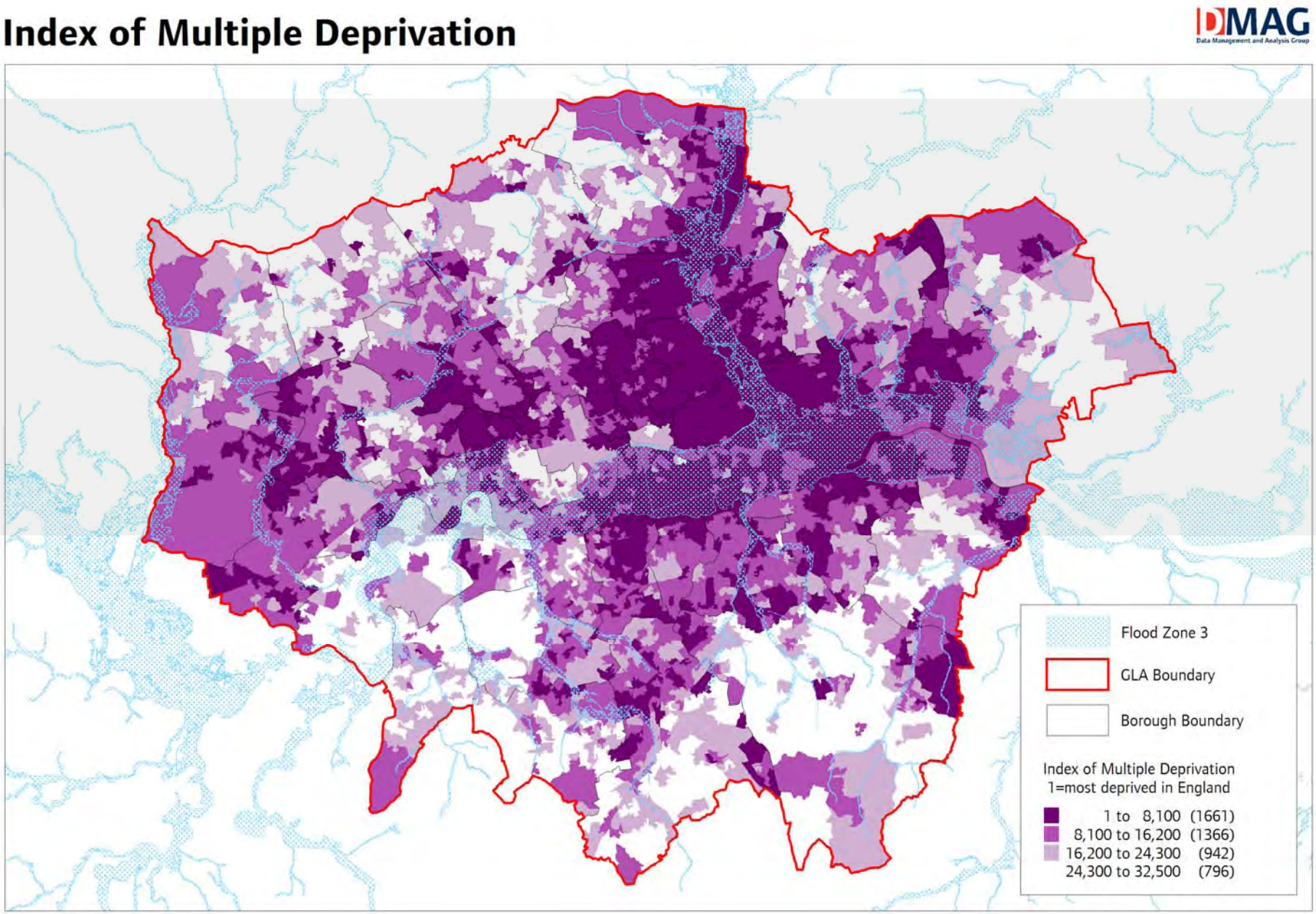
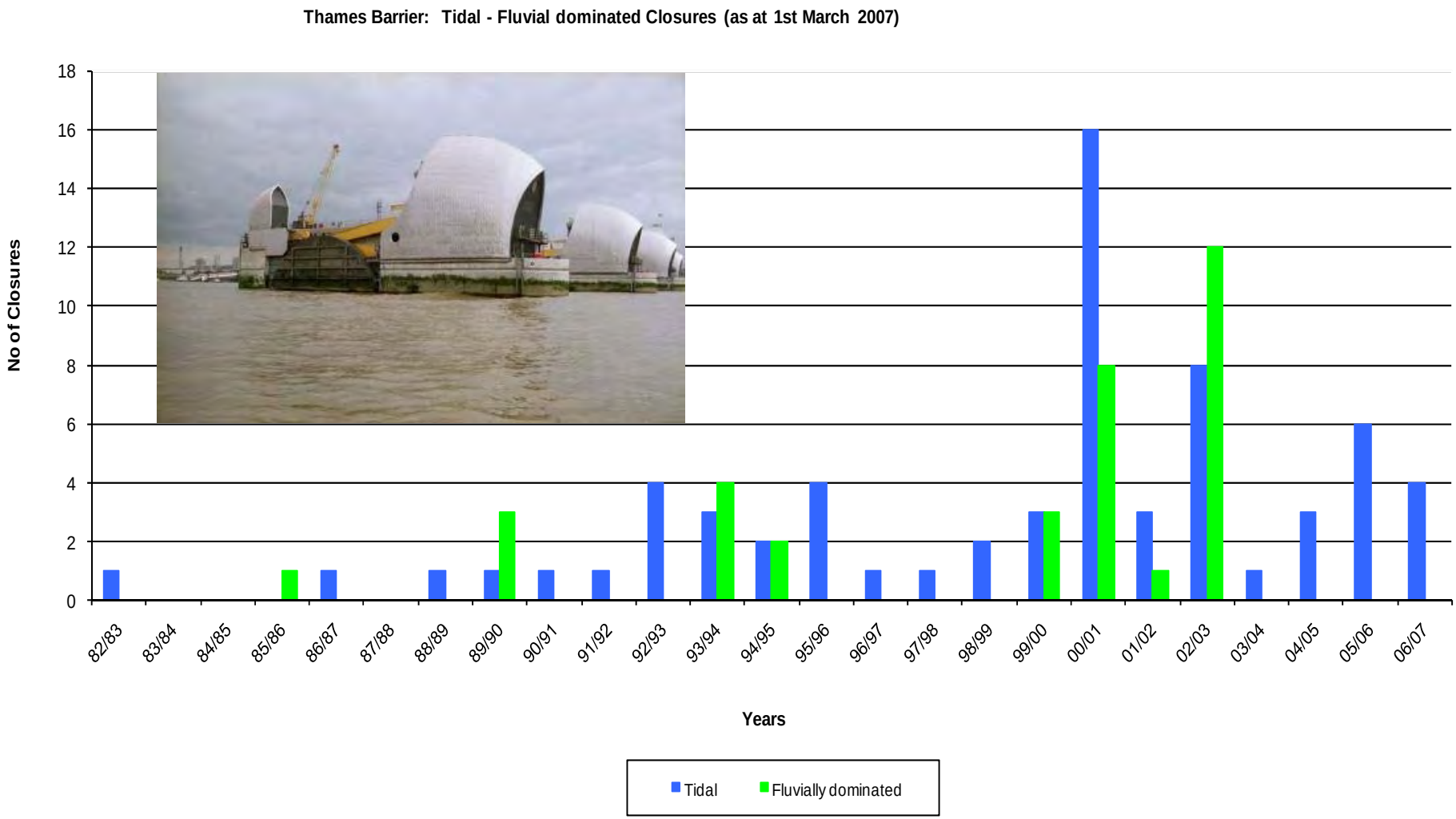
Index of Multiple Deprivation against flood risk

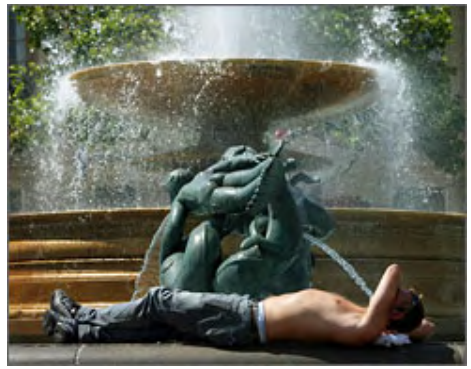




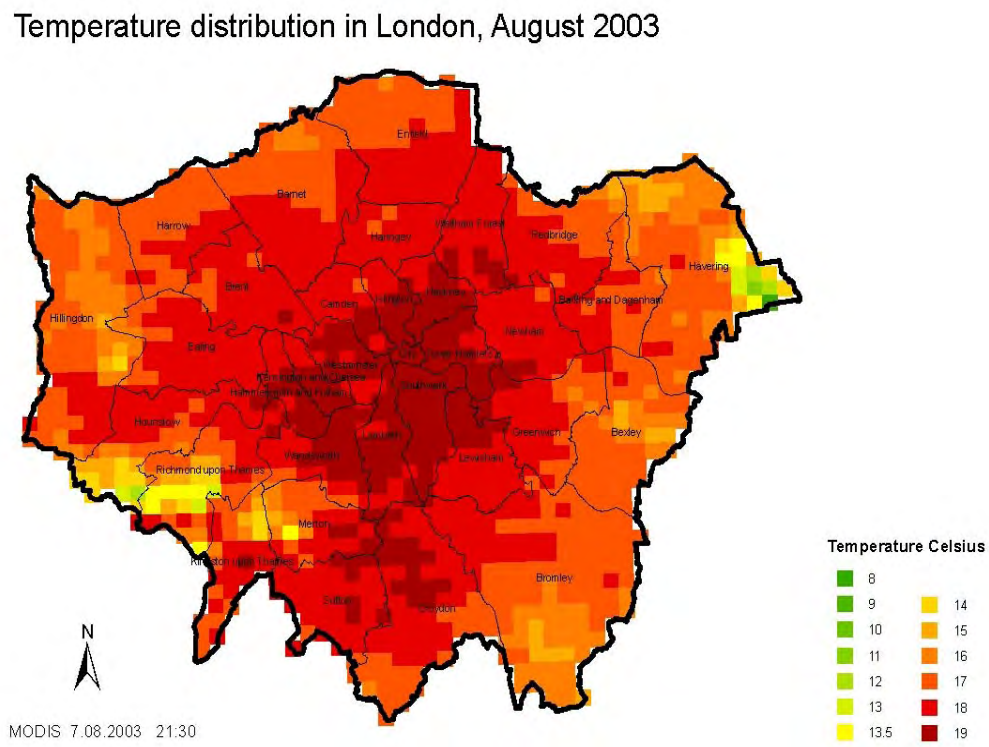
Fluvial and tidal closures of the Thames Barrier. Source Environment Agency

Tidal defences are designed to 1 in 2000 yrs tidal surge event
Current defences likely to be 1 in 1000 by 2030 and 1 in 100 by 2100

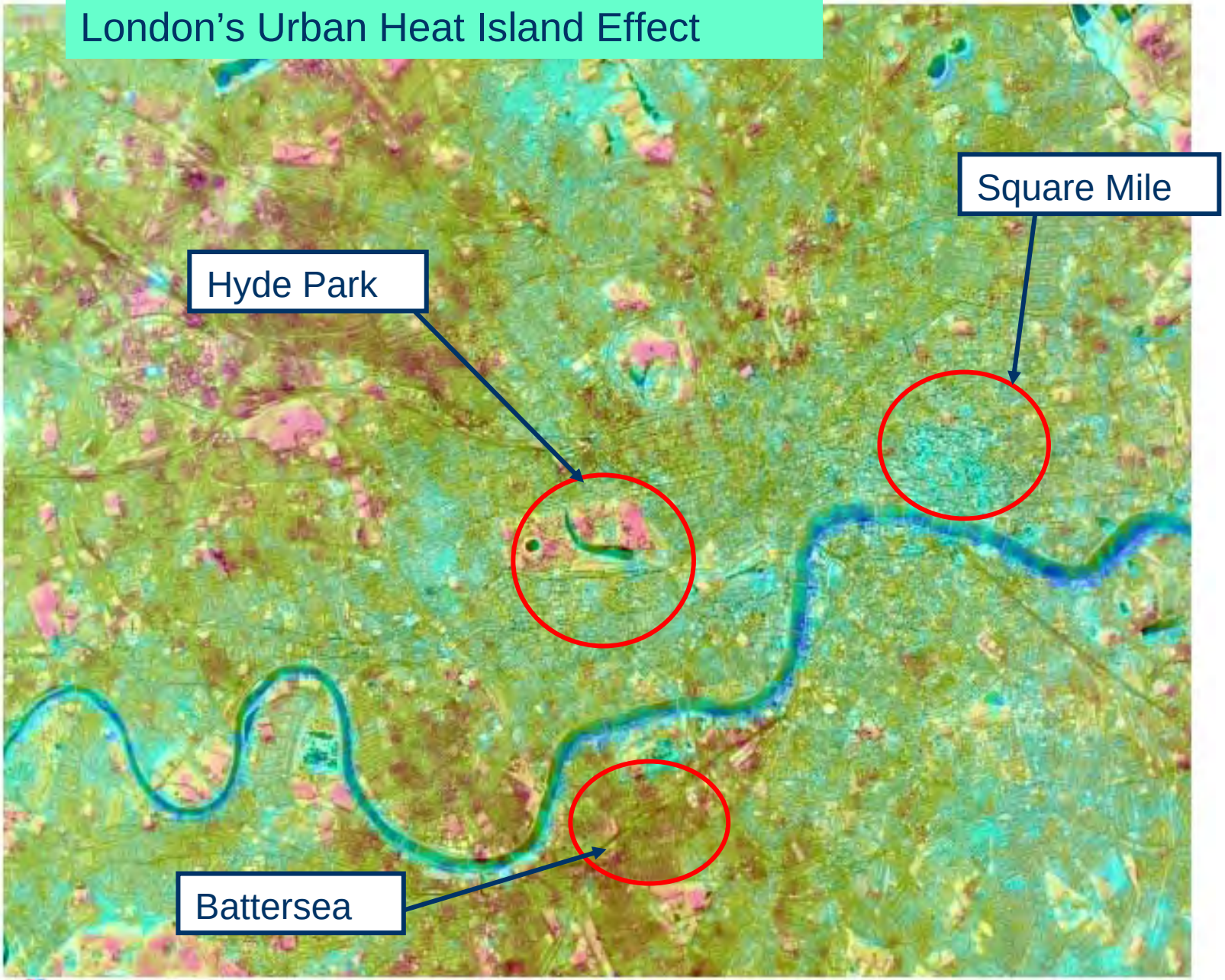
Hot in the city
(Overheating)



- 600 people died in the August 2003 heatwave
- London had highest numbers of deaths for any UK region
- London's heat island means inner London can be up to 9°C warmer than the greenbelt
- Further development may intensify the heat island effect

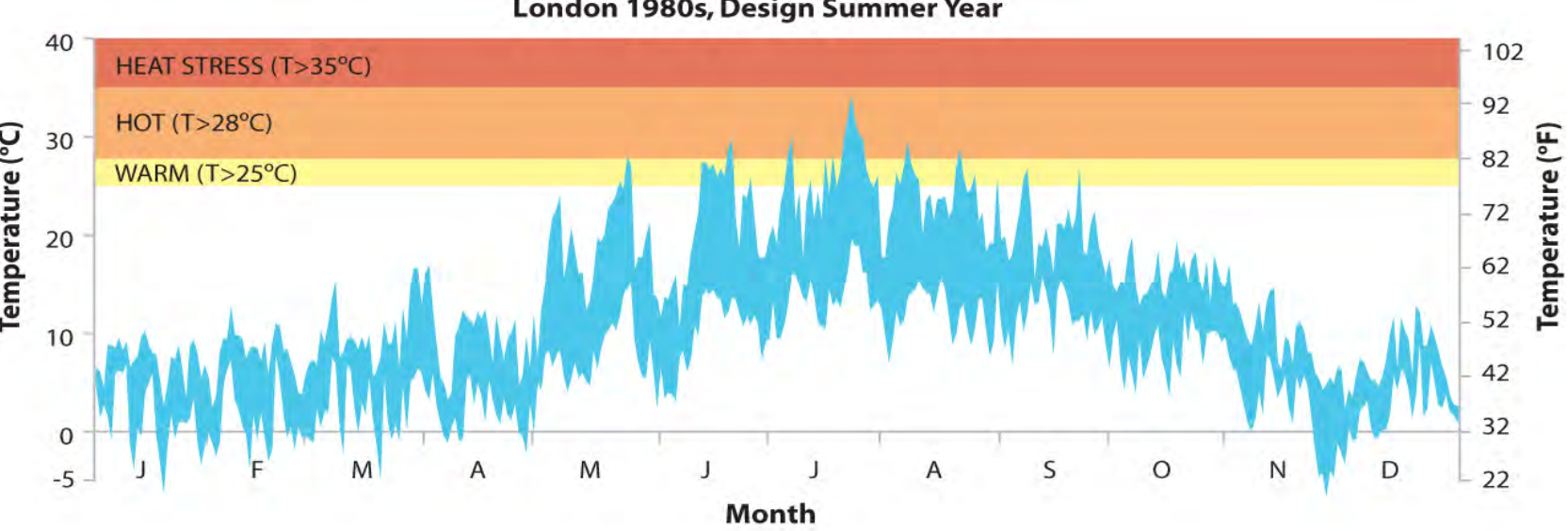


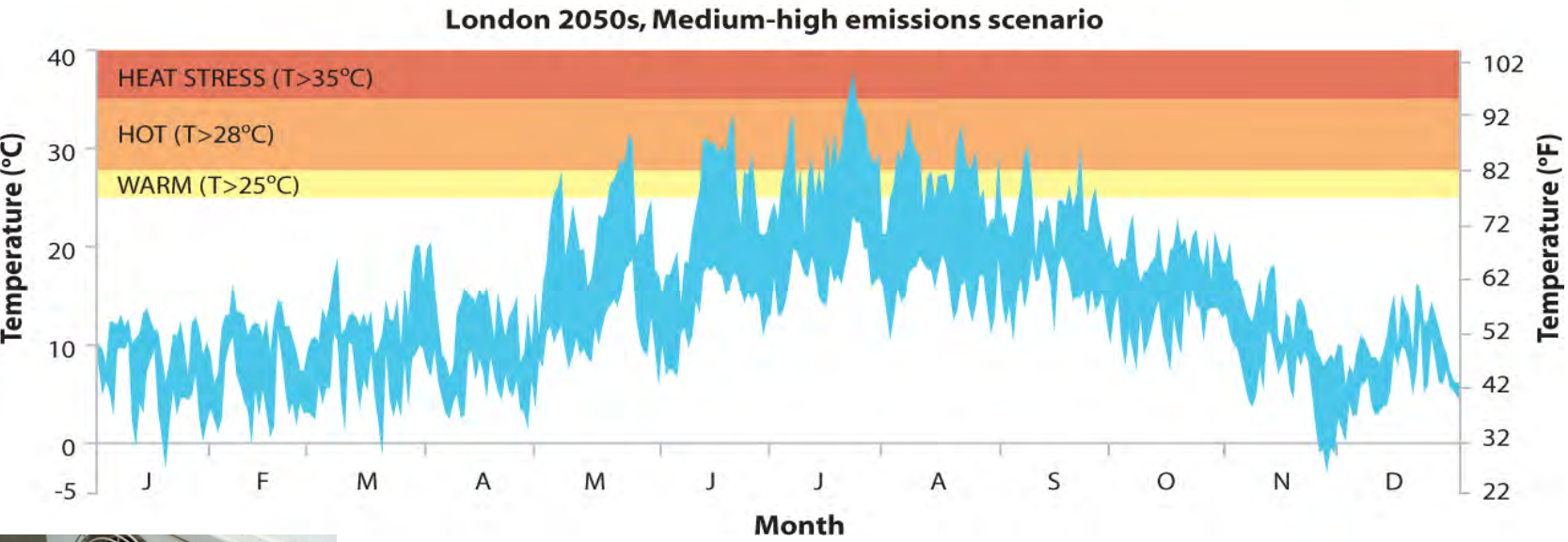
London's Urban Heat Island Effect



10am, 13 Sept 2003

16 23 48

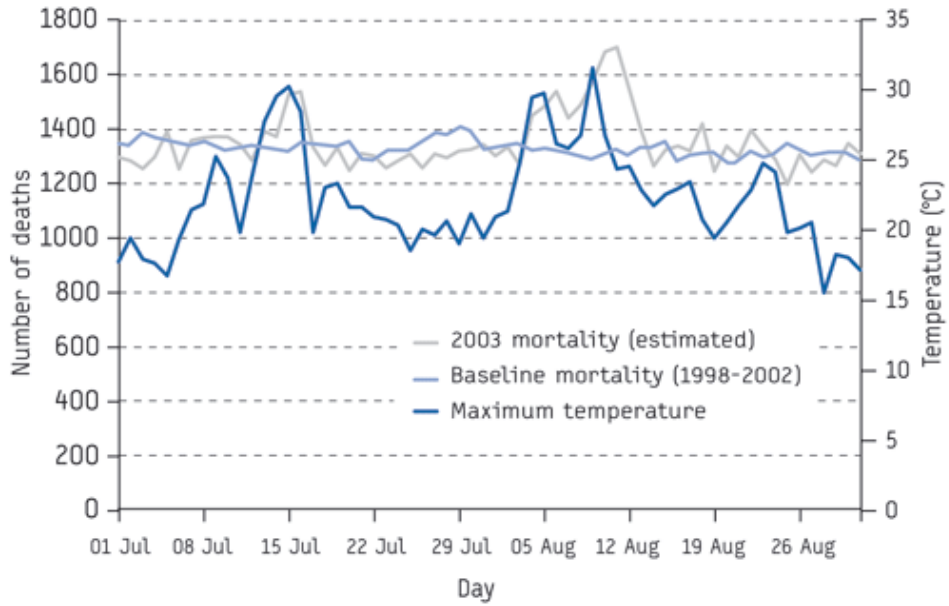




Overheating risks will increase as peak summer temperatures rise

London Heatwave Plan

- Level 1 – Awareness
  - Advice to professionals
- Level 2 – Alert
  - Public broadcasts and more specific advice
- Level 3 – Heatwave
  - Support for highly vulnerable, hospitals prepared
- Level 4 – Emergency
  - Heatwave may extend to power or water shortages, major incident may be declared



What does overheating mean for London?

- Challenges for transport
  - Modes, frequency, numbers of passengers
- Heat-related deaths
  - & fewer cold-related winter deaths
- Working conditions (max working temperature?)
- Need for emergency plans for ‘cool rooms’
- Importance of green space
- Vulnerable groups

Health

The principal effects of weather on health outcomes (Adapted from Kovats et al (2005) *Climate change and human health in Europe*

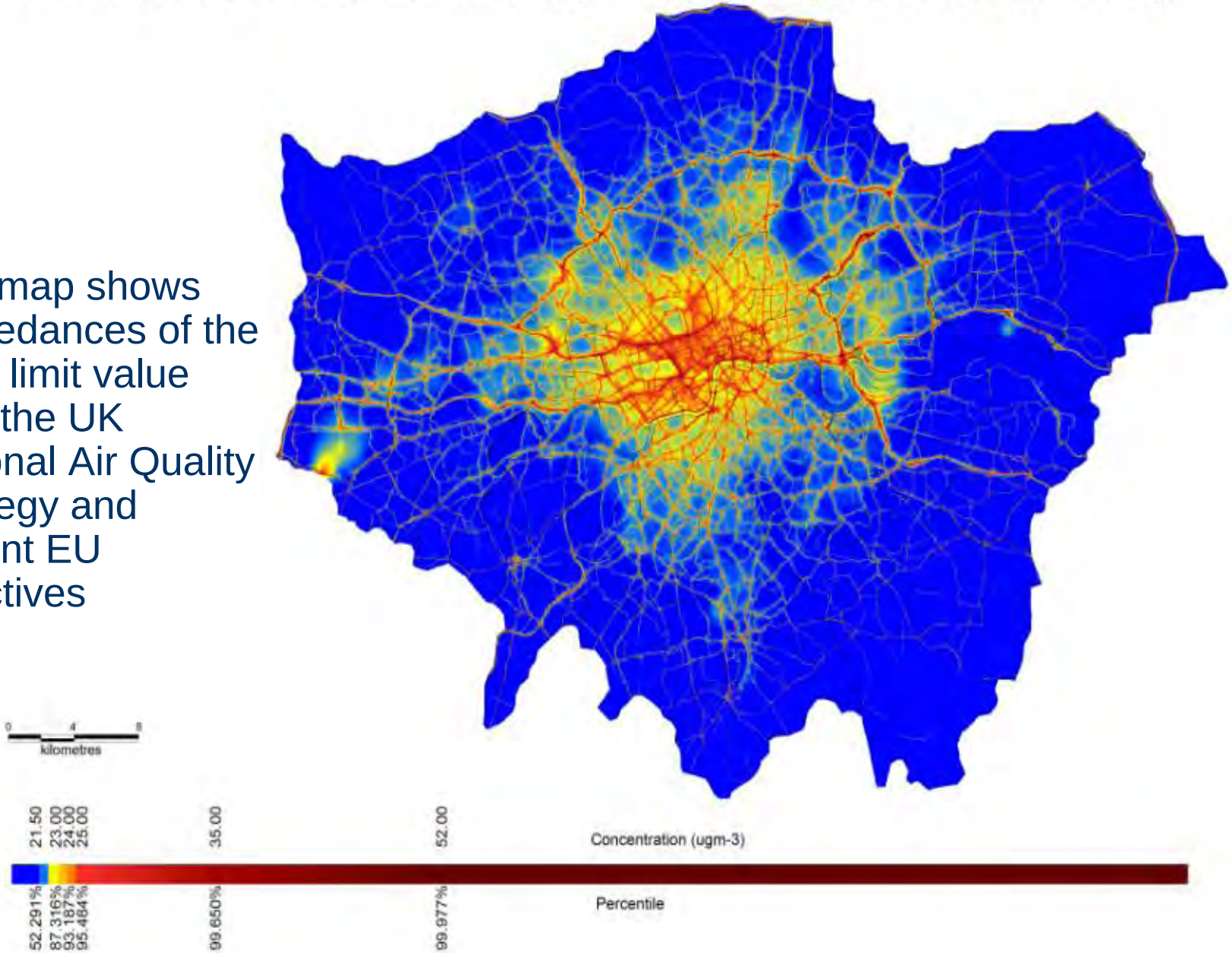
Health outcome	Known effects of weather/climate
Heat stress, cold stress	Deaths from cardiopulmonary diseases (i.e diseases that are related to both the heart and the lungs) increase with high and low temperatures Heat related illnesses (heat cramps, heat exhaustion and heat stroke) and death increase during heat waves
Air pollution related morbidity and mortality	Weather affects air pollution concentrations Weather affects the distribution, seasonality and production of air transported allergens
Morbidity and mortality resulting from weather disasters	Floods and windstorms cause direct effects (deaths and injuries) infectious diseases, long term mental health problems and indirect effects (temporary limitations on access the health and social care services)
Vector-borne diseases	Higher temperatures shorten the development time of pathogens in vectors and increase the potential transmission to humans Vector species have specific conditions (temperature, humidity) necessary to be sufficiently abundant to maintain transmission
Water and food-borne diseases	Survival of important bacterial pathogens is related to temperature Increases in drought conditions may affect water availability and water quality (chemical and microbiological load) due to extreme low flows Extreme rainfall can affect transport of disease organisms into water supply
Cataracts, skin cancers and sunburn	More cloud-free days and higher temperatures may encourage public behaviour that increases the risk of over-exposure to UV

Air Quality

- External air quality and impacts on human health
  - Pm_{10}, PM $_{2.5}$ NO_2, ozone (NO_x, VOCs)
- Indoor air quality
  - Need for ventilation
  - Interaction between indoor air quality, temperature, noise and ventilation
  - Improved energy efficiency may compromise ability to regulate ventilation and summer temperatures
    - Building Regulations/Code for Sustainable Homes may need amendment to address this

Modelled 2005 Annual Mean PM10 Concentration (microgrammes per cubic metre, ugm-3) based on 2002 Meteorology

This map shows exceedances of the 2010 limit value from the UK National Air Quality Strategy and current EU Directives



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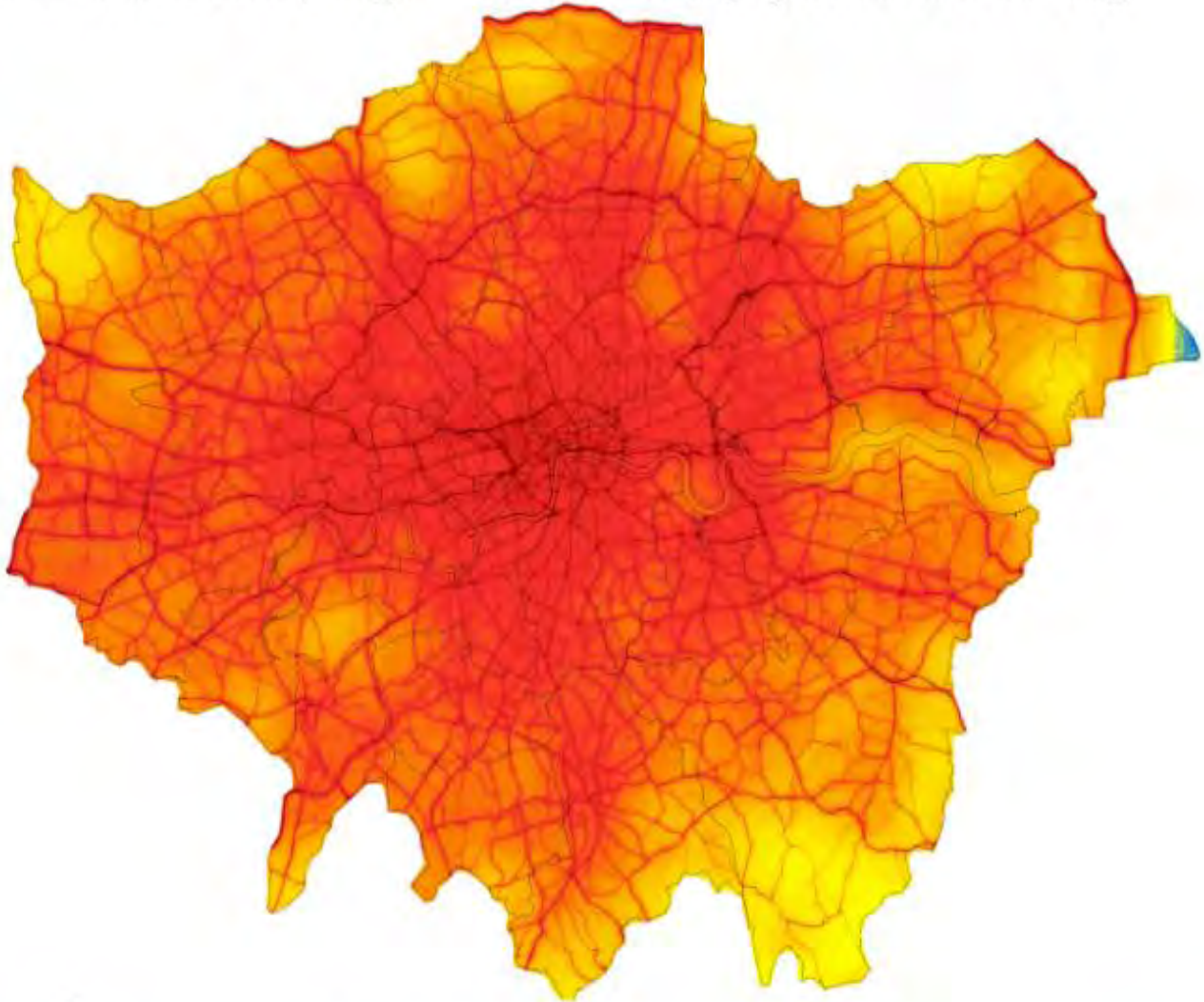


Aim of the CCAS

- **Aim of the strategy**
  - The aim of the Mayor's Climate Change Adaptation Strategy is *to facilitate the sustainable development of London by helping prepare London for the impacts of inevitable climate change*.

Objectives of the CCAS

- Objectives:
  - To reduce social inequality, including health inequality, in London
  - To ensure that new development and infrastructure is located, designed and constructed for the climate it will experience over its design life
  - To improve the resilience of London's existing development and infrastructure to the impacts of climate change
  - To ensure that London's economy is prepared for the challenges and opportunities presented by climate change
  - To ensure that business, public sector organisations and other institutions incorporate the impacts of climate change in their business plans
  - To promote and facilitate the adaptation of the natural environment
  - To raise general awareness and understanding of climate change with Londoners and to improve their resilience
  - To position London as an international role model in tackling climate change

The Mayor's Climate Change Adaptation Strategy:-

1. Identifies the strategic climate impacts likely to affect London
2. Provides the evidence base for establishing priorities and a framework to integrate action and enable consistency across the Mayor's strategies, plans and proposals
3. Provides a framework for where further investigation is required to assess climate risks and recommends which stakeholders should collaborate to achieve this
4. Provides policies and guidance where a precautionary approach is required to manage risk and to maintain future adaptation options
5. Recommends where contingency plans should be formed to manage situations where low probability, but high consequence risks exist
6. Recommends how London can optimise on the opportunities presented by climate change and become an international exemplar on adaptation

Structure of the CCAS

Introduction

Ch 1 London's Future Climate

Ch 2 Living in London

Ch 3 London's Economy

Ch 4 Connecting London

Ch 5 Quality of Life

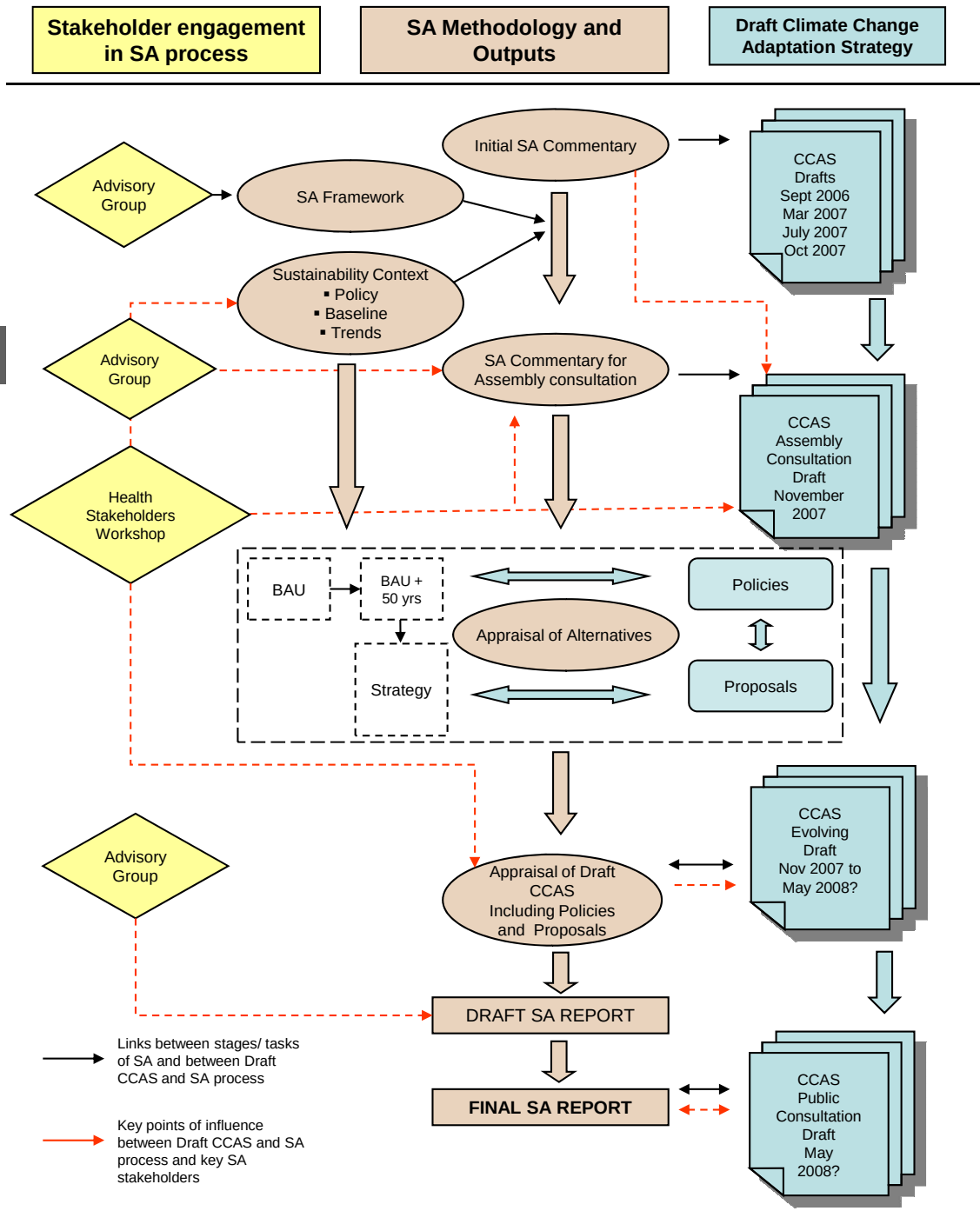
Ch 6 London's Metabolism

Integrated sustainability appraisal

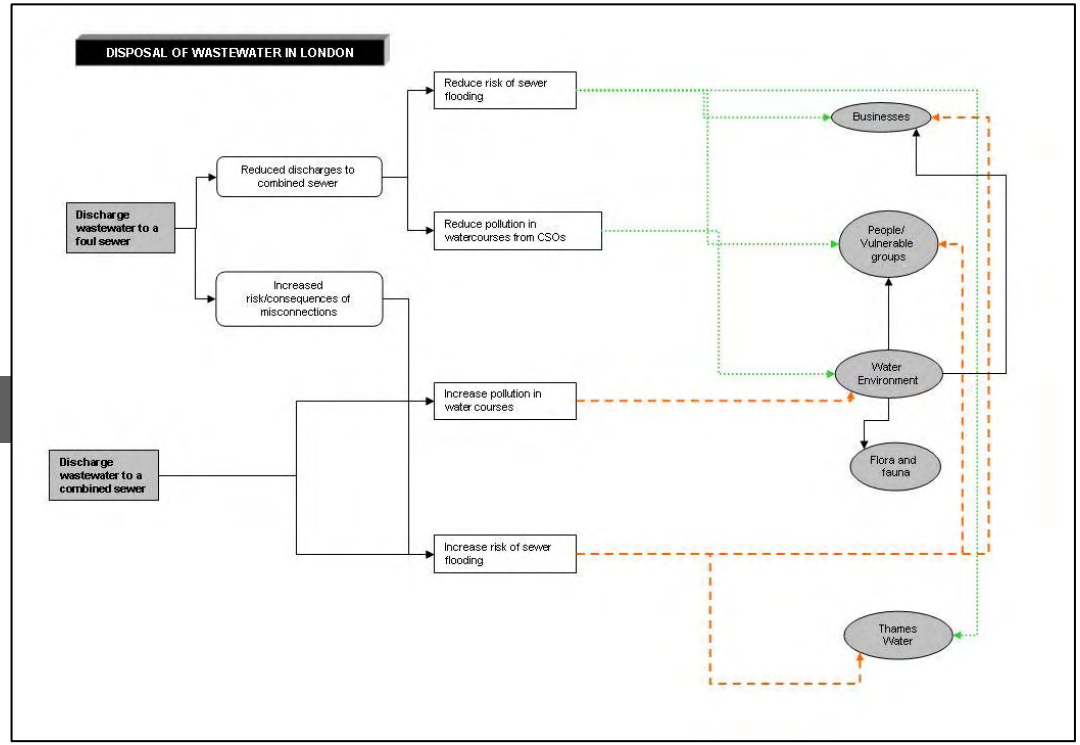
- Incorporating
  - SEA; and
  - Health impact assessment
- Timetable
  - Originally September 2006
  - Now likely to go to London Assembly for consultation November 2007?
  - But tied in to GLA Bill which will make CCAS a statutory strategy
  - Now not possible before May 2008 (due to Mayor election)

SA process

- Also in ‘parallel’ with the SA of the Water Strategy
  - though in practice some lag between them and different political considerations
  - (note scoping was done separately internally)



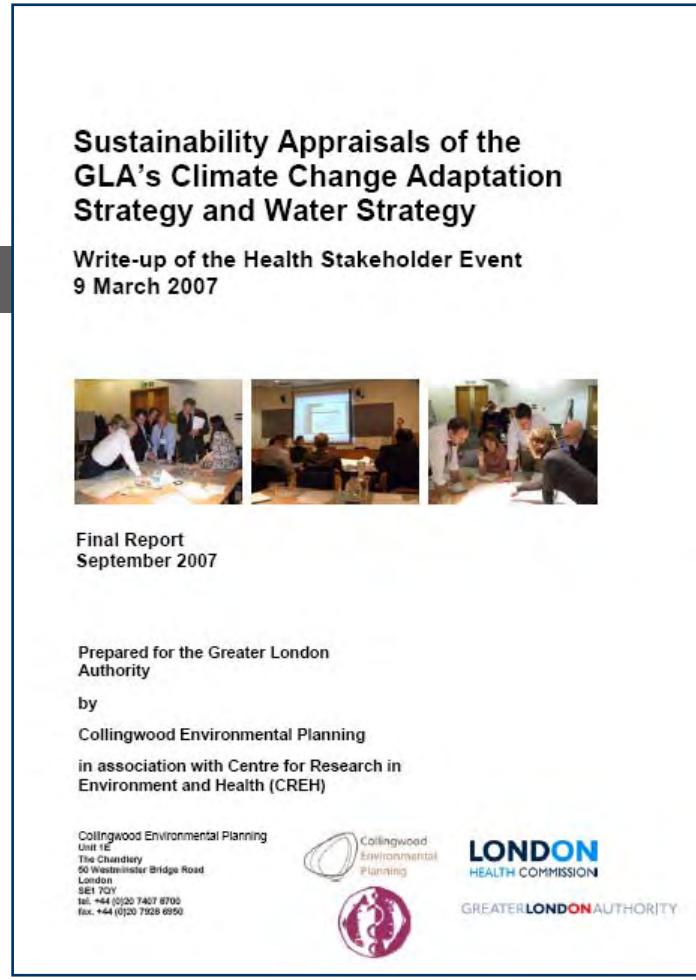
SA Process



- (Scoping)
- Initial Commentary
- SA framework
  - PP review
  - Baseline
  - SA objectives
  - Health Workshop
    - (to contribute to Part A – Context for the SA Report)
- Commentary for London Assembly consultation
- Alternatives
- Appraisal
- SA Report and public consultation

Health workshop

- Raise awareness among key health stakeholders about CCAS and Water Strategy;
- Provide an opportunity for stakeholders and experts to consider the potential impacts of key aspects of the strategies on health determinants, health outcomes and health inequalities;
- Identify gaps in evidence and ways of addressing these gaps (including exploring alternatives); and
- Provide some clear recommendations that will guide the SAs of the strategies.



Sustainability Appraisals of the GLA's Climate Change Adaptation Strategy and Water Strategy

Write-up of the Health Stakeholder Event 9 March 2007

Final Report
September 2007

Prepared for the Greater London Authority

by

Collingwood Environmental Planning

in association with Centre for Research in Environment and Health (CREH)

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Options/alternatives

- Alternatives
  - Business as Usual, BAU + 50 years, Strategy
  - Alternative Policies and Proposals (integral to developing the strategy)
    - E.g. Prevent, Prepare, Respond, Recover
      - in flooding terms: build flood defence wall, build your house on stilts, run away, stay away!
  - Use of causal chain analysis to explore effects
- Examples:
  - e.g. CC constraints may provide incentive for alternative modes (e.g. trams rather than tube expansion as easier to cool)
  - e.g. No development on flood plain, or temporary development to be withdrawn in 50 years.

Baseline, BAU and alternatives

- Central to CCAS
  - the Strategy itself is responding to a specific external factor which will bring about significant change to the baseline
- Several steps
  - Understand what effect climate change will have on London in the future (BAU and BAU+50)
  - Understand what difference the strategy will make in terms of policy and action vs BAU (and BAU+50)
  - Appraise (a) the Policies and (b) the Proposals of the Strategy against the SA objectives (by chapter)
  - Bring together in a summary appraisal matrix of BAU, BAU+50 and Strategy as a whole against SA objectives.

Reflections on CCAS and the SA process (1)

- Very strategic strategies need tailored SA approaches
  - How to use the baseline? How to understand the future? Using scenarios. Consultation, advisory group, stakeholders – who, how and when?
  - What are you assessing? Not always clear.
  - Using causal chains to trace pathways, interactions and cumulative effects (visual and user friendly for consultation workshops)
  - Need to get away from standard formats that may not be appropriate
- Political nature
  - Extended timescales may offer opportunities for greater iteration between the strategy development process and the SA
  - Practically though can be very ‘stop/start’, and budget and resource implications

Reflections on CCAS and the SA process (2)

- Importance of iteration of SA with the Strategy development process
  - SA can contribute significantly to helping a strategy be strategic and make a difference, including exploring real alternatives
  - SA can question the strategy-making process, e.g. How does it make a difference?
  - SA input can help ensure the strategy is actually appraisable
- Importance of the process rather than the output
  - Direct engagement with strategy development team throughout
  - Use of commentaries along the way
  - Input often appreciated as there may not be suitable ‘sounding boards’ internally for such strategic thinking

Thank you


Stay cool
in the heat
Here are a few tips for keeping comfortable in hot weather:
• Carry water with you
• Don't board a train if you feel unwell
• If you feel unwell get off at the next stop and seek help from our staff
• Avoid pulling the passenger alarm between stations
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Vittel
Transport for London
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