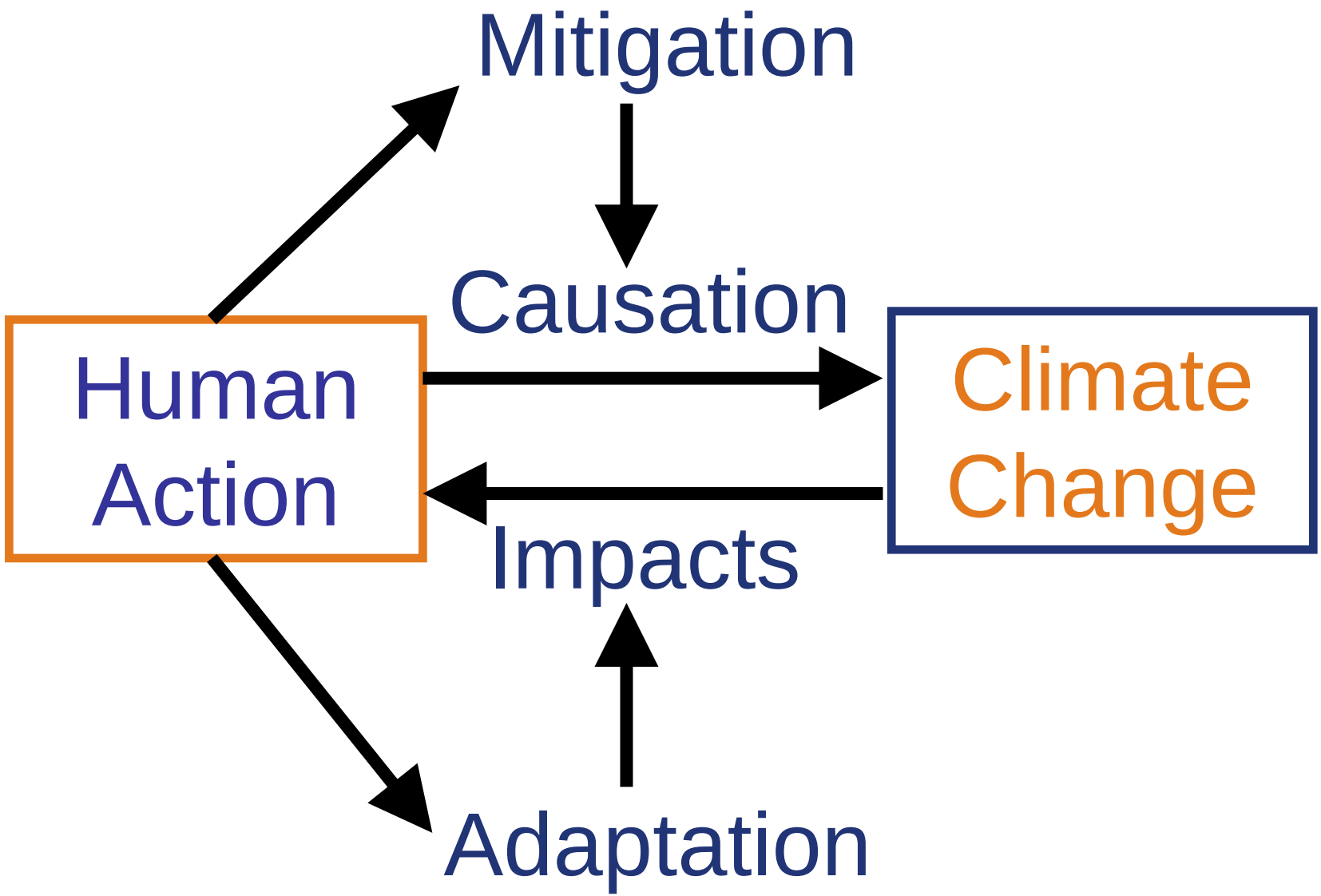
Adapting to cope with Climate Change – where next for Oxfordshire?

Oxfordshire Environment Partnership

17th March 2008, County Hall, Oxford

Dr Chris West, Director
UK Climate Impacts Programme



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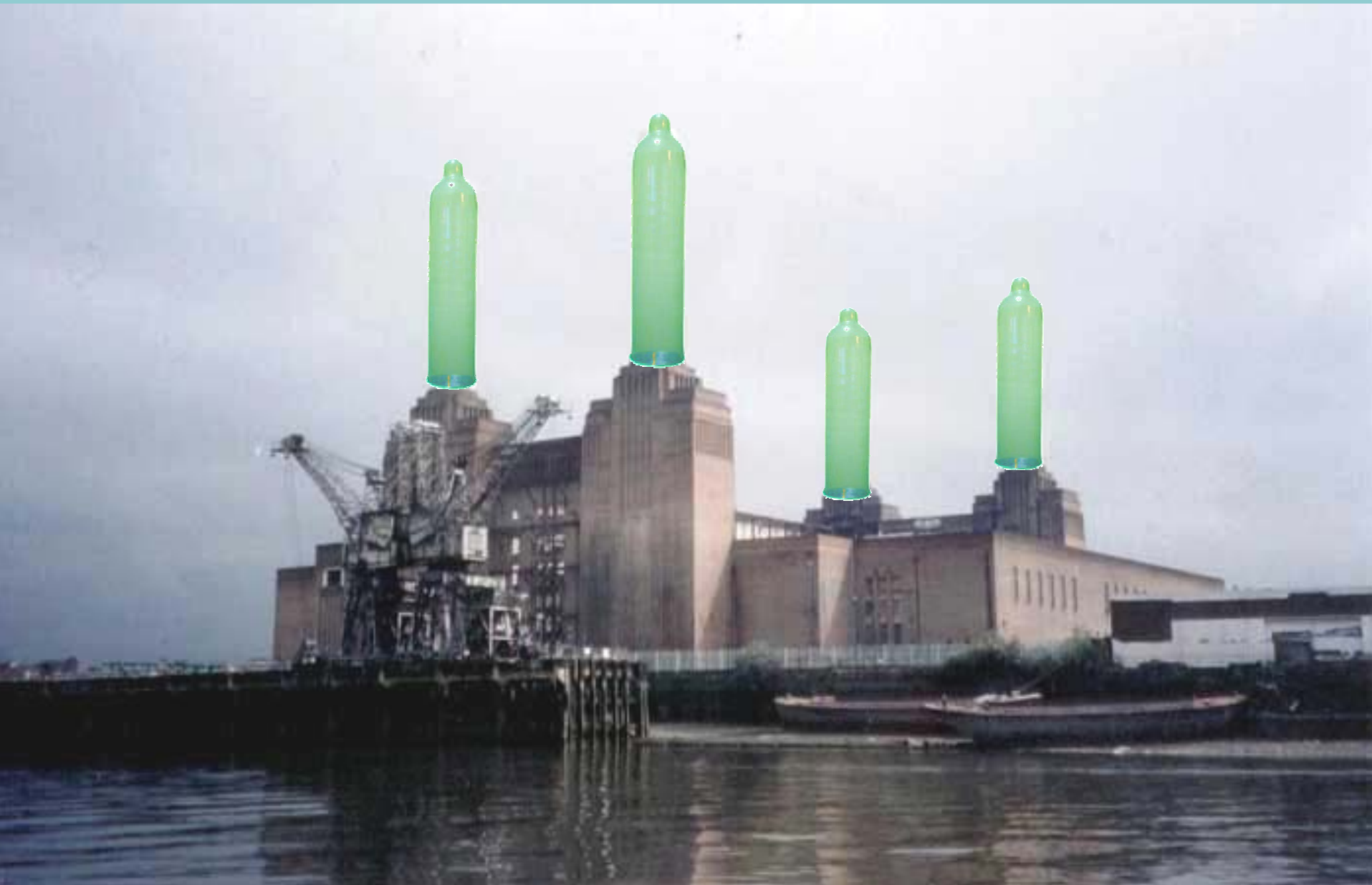
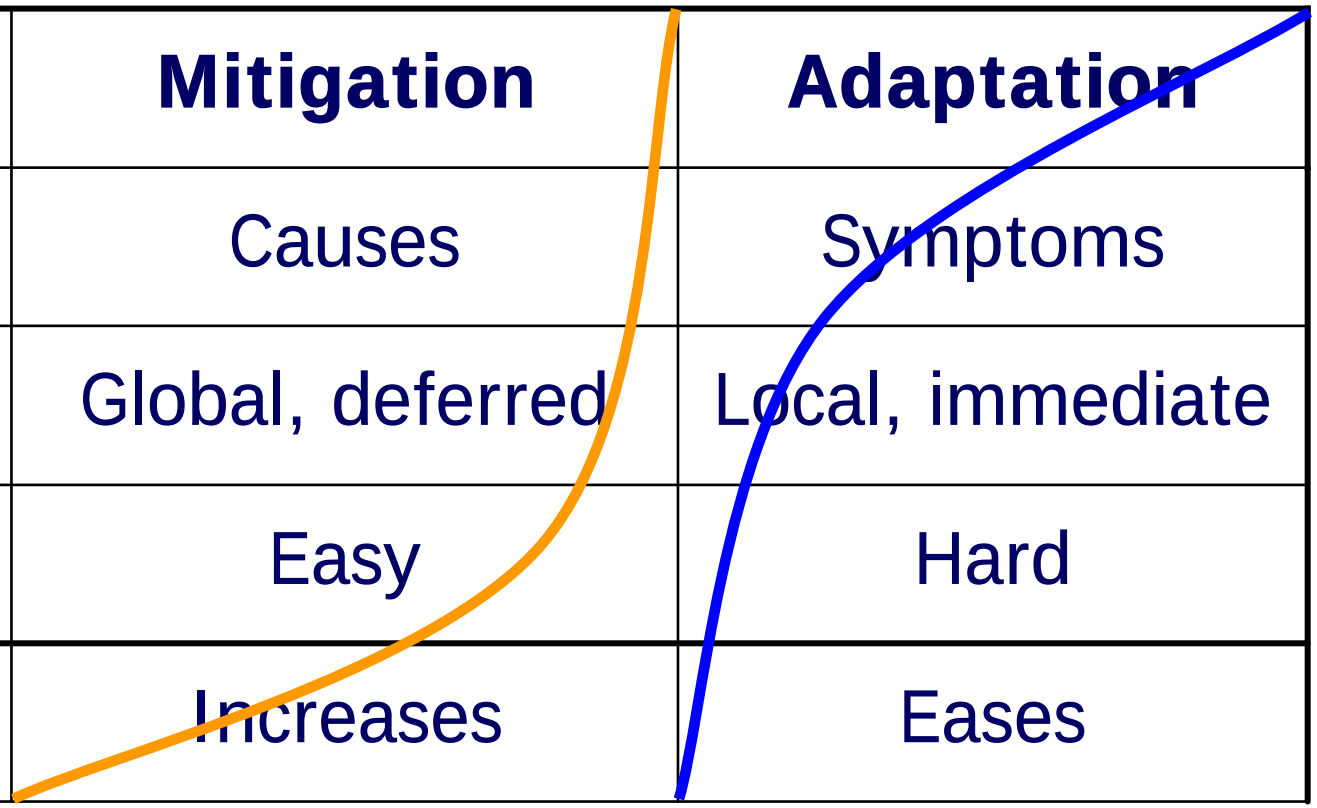
Mitigating climate change



Adapting – still winning even when the rules change

Climate change responses

Response:	Mitigation	Adaptation
Addresses:	Causes	Symptoms
Benefit:	Global, deferred	Local, immediate
Concept:	Easy	Hard
Slope:	Increases	Eases



Not alternatives!

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Balanced responses

1. The climate change we expect in the next 30-40 years will be due to our past greenhouse gas emissions.
2. Climate change later this century is being determined by the emissions we allow now.
3. We need to alter our way of life so that we can adapt to the changes that are already in the climate system....
4. ....as well as limiting our future greenhouse gas emissions.

Two approaches to Adaptation

Scenario Approach

- Climate CHANGE

Vulnerability Approach

- Climate RISK

Scenarios: “Predict and decide”

- Focus on Climate **Change** – assumes “today” is OK
- Led by physical science model developers
- Uncertainty remains a barrier to decision-making
- Climate remains a separate issue
- Decision-makers will always need better data

Vulnerability: “Manage risks”

- Focus on Climate **Risks** –assumes “today” needs attention
- Led by decision-makers
- Assess and manage current risks, then turn to future
- Uncertainty is made explicit and addressed
- Climate easier to mainstream into everyday
- Immediate benefits to “day job”

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Present Climate

- Are we well-adapted to the present?
- Is perfect adaptation possible? – desirable?
- Do we manage present climate risks adequately?

- Part of adaptation to climate change is managing the extremes of the present climate

- Resilient communities, robust strategies, adaptive planning (good whatever happens), ecology of actors (working together)

Do we notice the weather?

Yes	No
Farmers	Boards
Sailors	Directors
Operators	Finance Officers

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Local Climate Impact Profile

An **LCLIP** has three stages:

1. **Remember** what has happened:
   - Use newspapers as source of incidents
   - Ask managers about impacts, responses and **costs**
2. **Record** what does happen:
   - Set up a system to log impacts
   - Measure weather that caused them
3. **Plan** for what will happen:
   - Use stage 2 to determine critical thresholds
   - You know your appetite for risk
   - Ask intelligent questions about future

(UKCIP running a trial with Oxfordshire County Council)

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21st Century UK climate changes

Sea Level Rise

Global and isostatic (19-79 cm)

Temperature

Higher mean (2 - 5°C warmer)

Higher extremes

Greatest change in SE

Precipitation

Wetter winters (5 – 30% more)

Drier summers (15 – 50% less)

More falls in extreme events

Storms

More in winter (to 60% more)

Figures in red give changes by 2080s for SE England under **low emission** and in grey for **high emission** scenarios

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Impacts on Agriculture

- New varieties and crops
- New pests and diseases
- Longer growing season
- Animal welfare
- Access to waterlogged land
- Loss of cold events
- **World food market**

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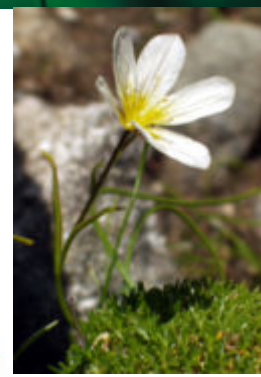
Impacts on Biodiversity

- Changing bio-climate space
- New relationship between light and temperature - mismatch between species
- Better over-winter survival
- New exotic arrivals



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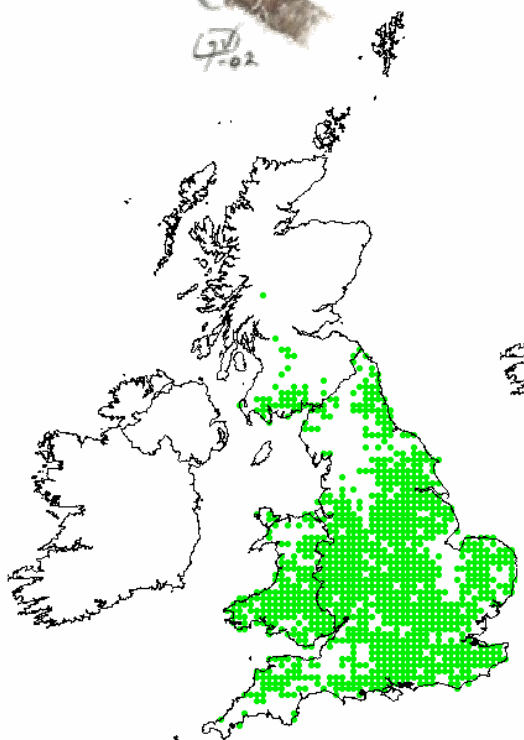
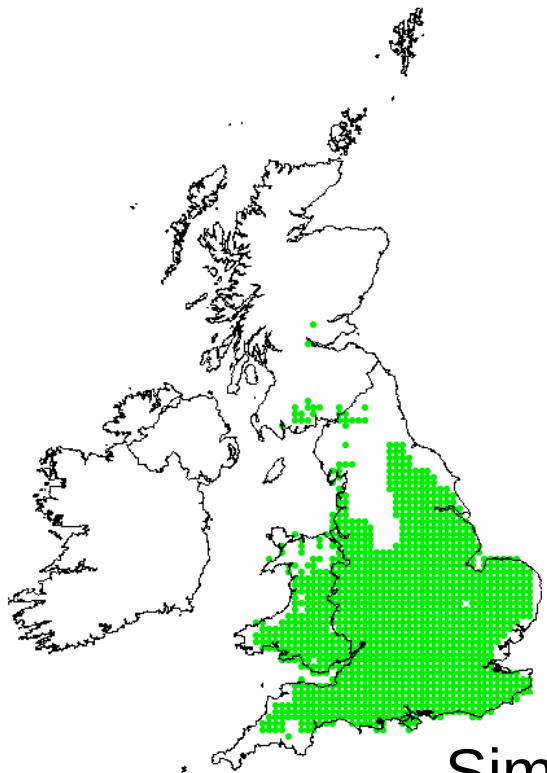
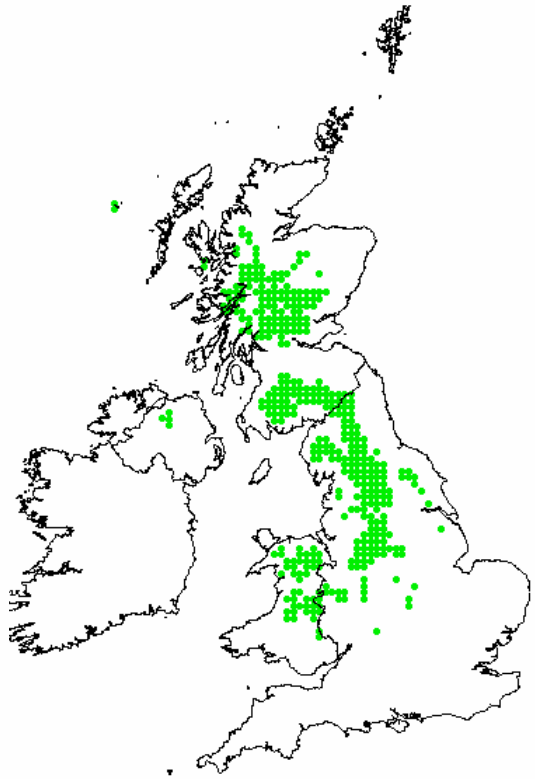
Climate space for Willow Tits



Observed



Simulated



2050s, High

UK Clima
Impacts F

Moving a distribution

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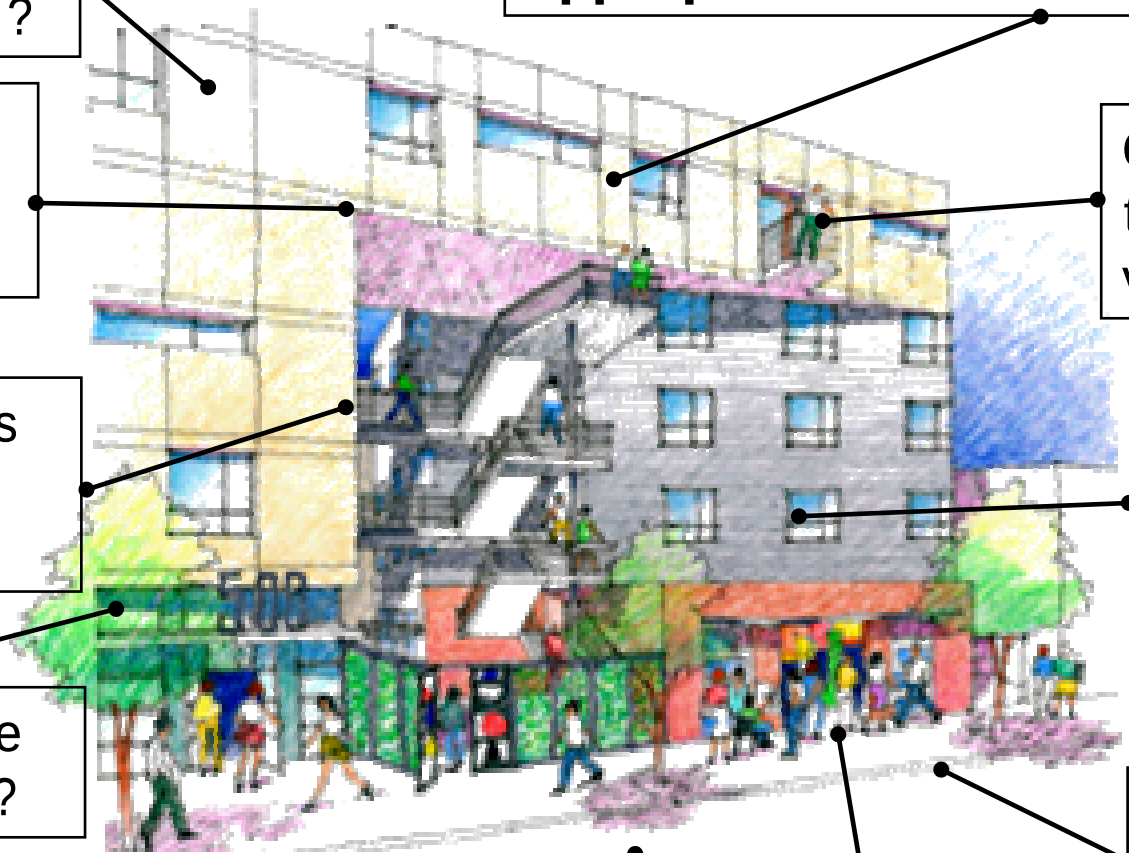
A well-adapted building?



Light surfaces to reduce UHI?

Design tested with climate appropriate to lifetime of building?

Summer shade or shutters?

Occupants trained to use ventilation?

Rainwater goods to cope with extreme rain?

Ventilation with security?

Trees to provide shade and cool?

Foundations reinforced for soil shrinkage?

Facilities for café culture?

Permeable surfaces to absorb rain?

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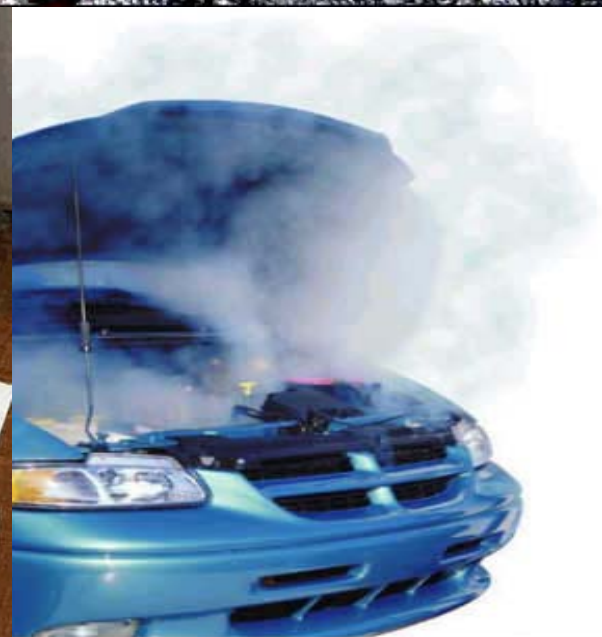
High temperature extremes



High temperature extremes

- Cause damage to tarmac roads, runways
- Cause speed restrictions on railways
- Make buildings uncomfortable
- Reduce worker productivity and safety
- Overload cooling systems at all scales
- Pose health risks to elderly, ill, and very young

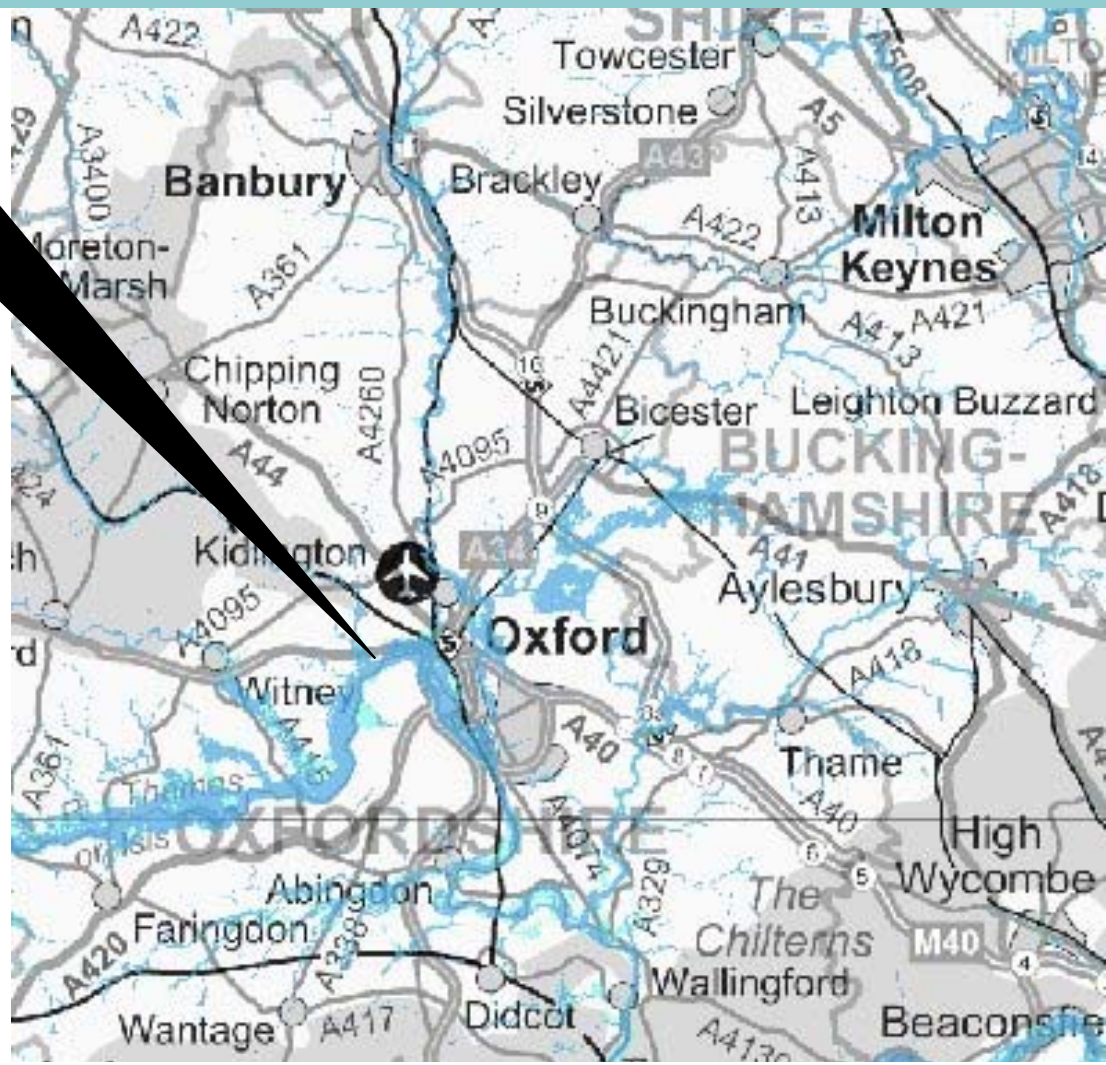
Very heavy precipitation

Very heavy precipitation

- Overwhelms down-pipes at building level
- Overwhelms storm drains over small area
- Penetrates building fabric
- Causes fluvial flooding
- Causes disproportionate soil erosion
- Is not absorbed for storage

Fluvial Flooding

- EA 1% annual risk shown blue
- Many properties at risk
- Anticipate more heavier winter rain
- Changed permeability and flood storage
- Flood defence can transfer risk downstream



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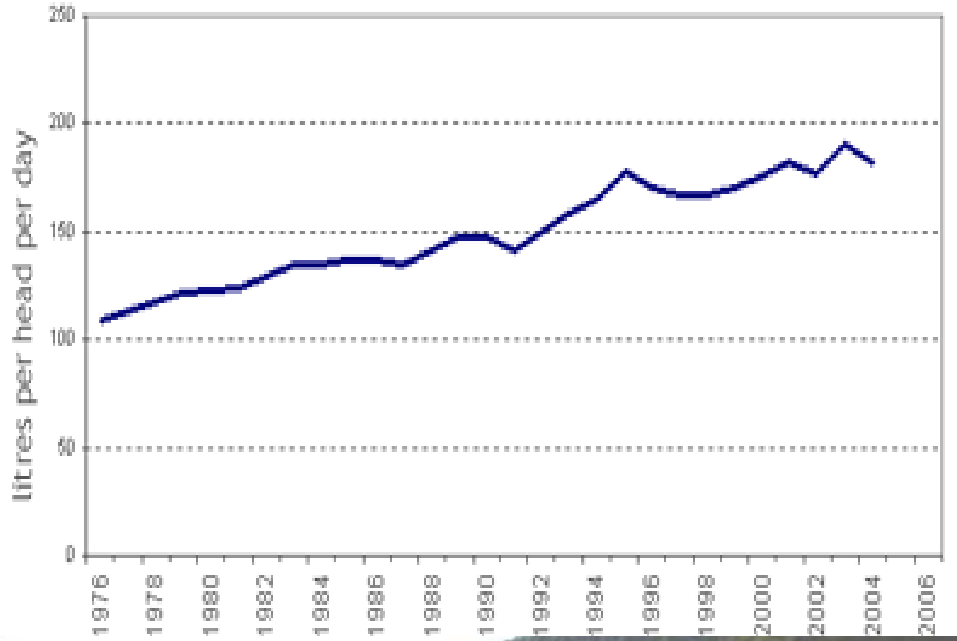
Drought


litres per head per day
0
50
100
150
200
250
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006

Drought

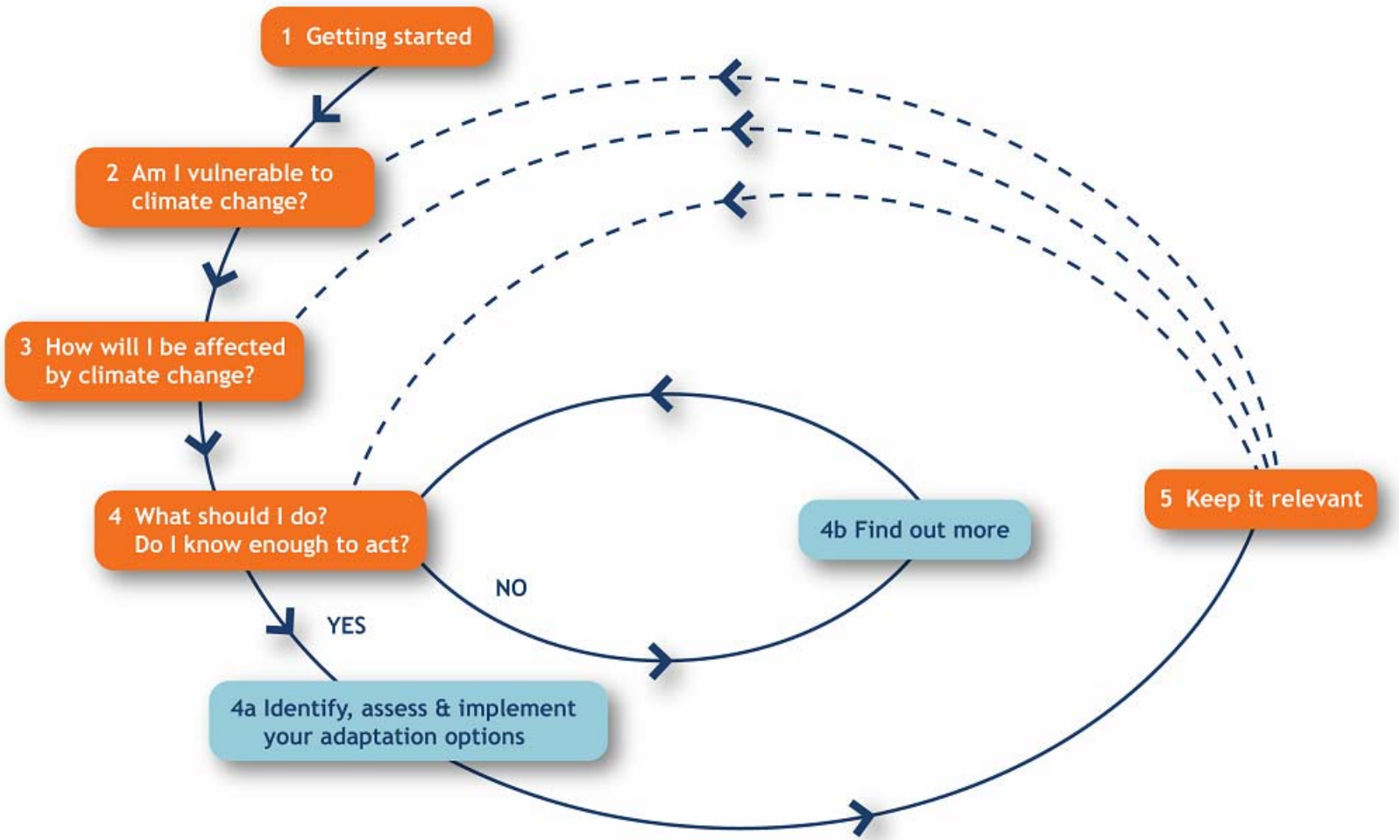
- Growth in demand
- Conflicts over water use (drinking, irrigation or industry)
- Not enough water to dilute pollution
- Contraction of clay and peat soils
- Wild fires

How good a response to drought risk?

Oxfordshire adaptation

- Flooding!
- Stage 1 of LCLIP completed
- Council-wide risk assessment
- Adaptation being incorporated into service strategies (transport, property, school building programme)
- Performance Indicator N188 may be addressed in LAA2 Climate Change Target 3 – “Being prepared for climate change”
- Decision by Public Service Management Board?
- How to glue adaptation onto all other targets?

New Adaptation Wizard



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UKCIP and Oxfordshire

- UKCIP wants to learn about the process of adaptation in a County Council by assisting the process
- Stage 1 of LCLIP completed
- Aim to trial stage 2 of LCLIP
- Now planning for next phase of relationship

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