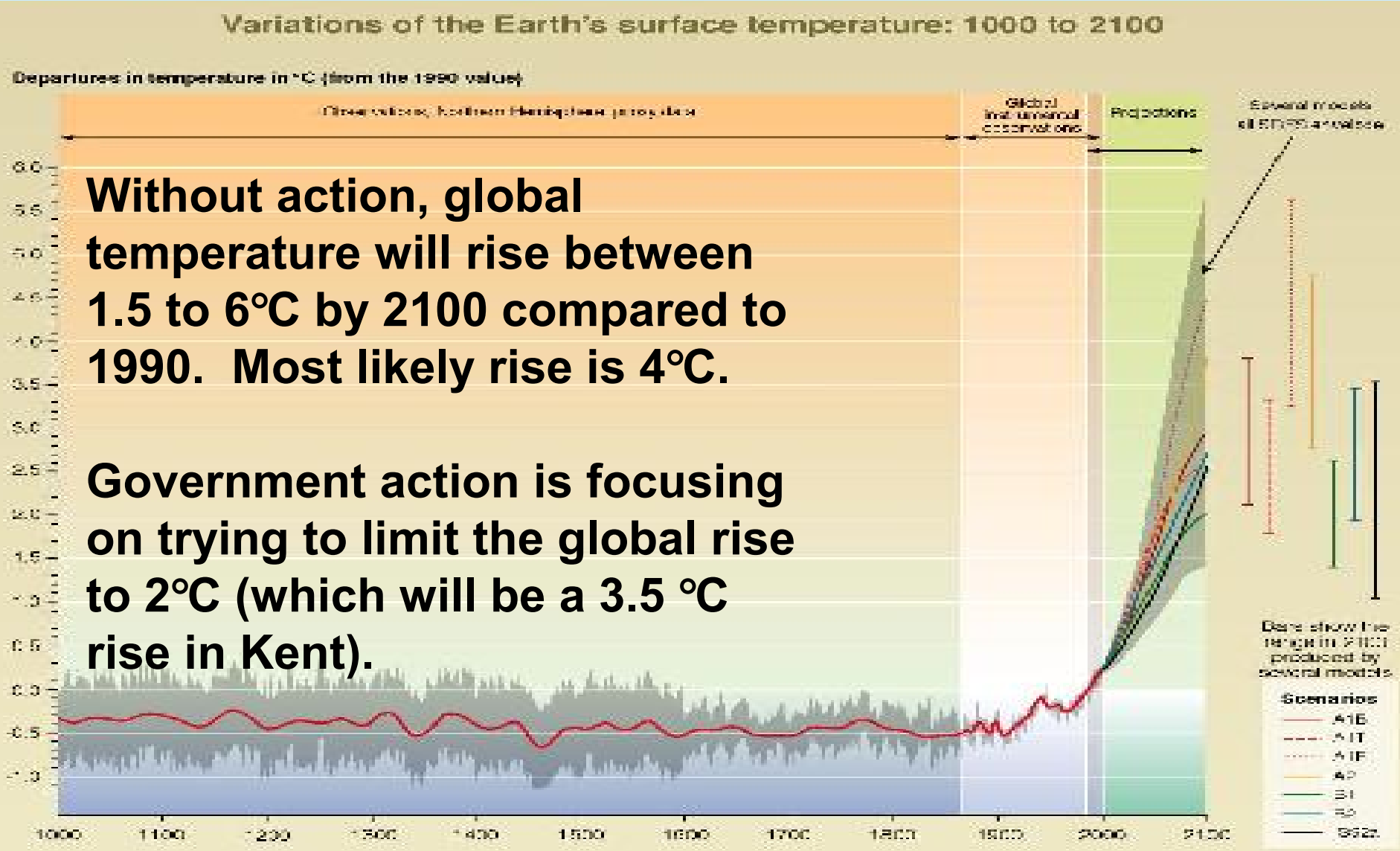
Climate change adaptation: A case study from Kent.

Taken from a presentation by

Dr Sarah Anderson | Climate Change Project Officer
Corporate Policy Unit | Chief Executive's Department

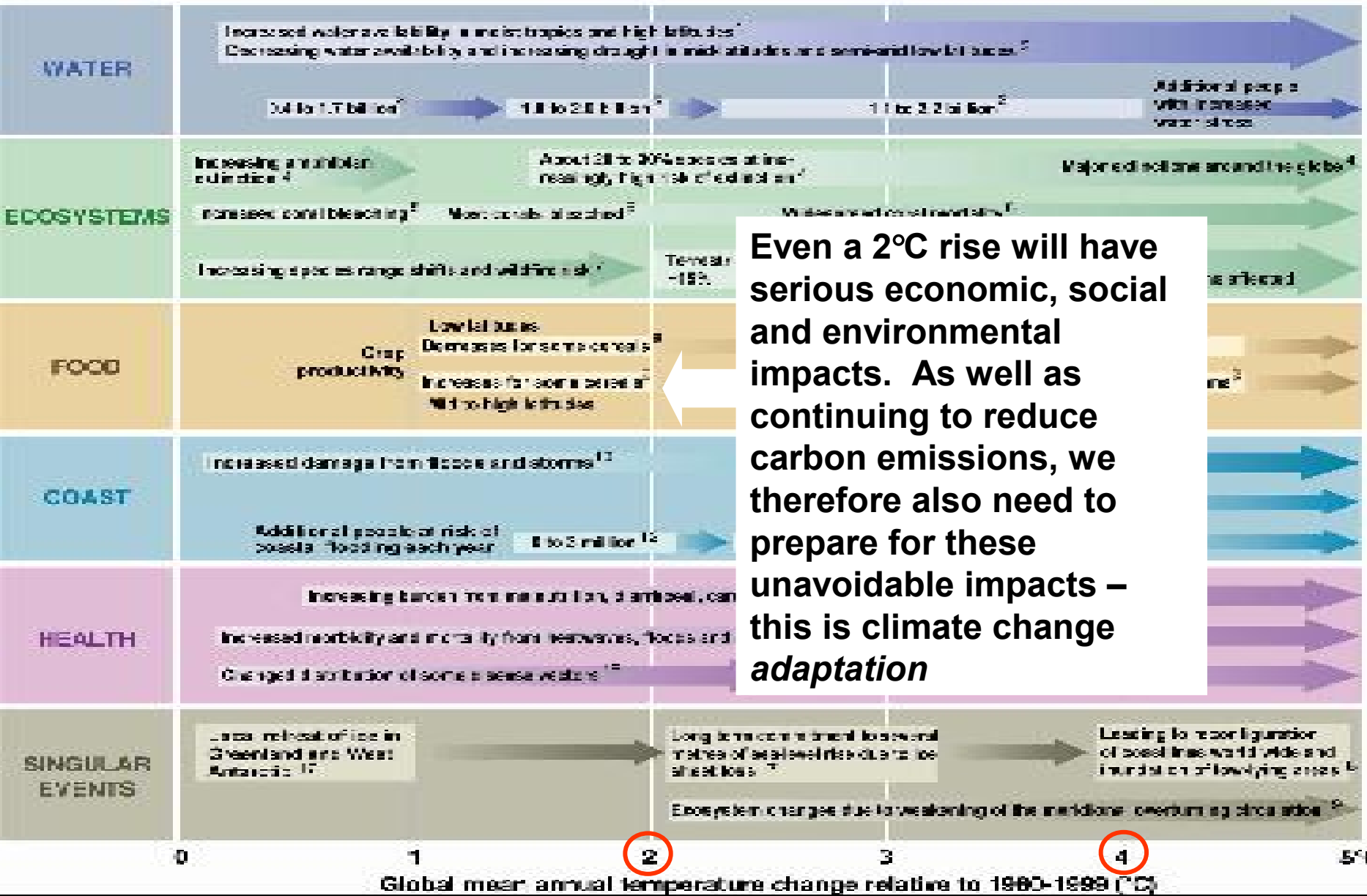
Temperature rises to 2100



Without action, global temperature will rise between 1.5 to 6°C by 2100 compared to 1990. Most likely rise is 4°C.

Government action is focusing on trying to limit the global rise to 2°C (which will be a 3.5 °C rise in Kent).

Expected global impacts



Impacts in Kent

Kent expects some of the greatest changes in the UK*…

- **Annual / seasonal climate averages**

Warmer, drier summers (spring, autumn too)	*Mean temperature in Kent risen >1°C since 1960; at least 2°C by 2040* *Summer rainfall decreased by 40% in south east since 1961; soil moisture deficit will rise*
Milder, wetter winters	*Mean winter temperature risen 0.7°C since 1914.* *Winter rainfall increased by up to 50% since 1961.*
Rising sea levels	*Sea level rising 1-2mm/year. Could rise 40cm by 2050 (1m by 2100)*
Shifting seasons	*Thermal growing season increased 30 days since 1990*

- **Extreme weather events**
  - More very hot days (2003 heatwave will be mild by 2060)
  - More intense downpours of rain (flash flooding)
  - Increased flood events (at least 8.5% Kent population at risk now, rising)
  - Shorter return periods for high water levels at coast
  - Changes in storminess, high winds / storm events

* Due to position in south-east, length of coastline, population density and mobility, proximity to continental mainland

Stern Review

- Cost of doing something (<3% of GDP by 2030) is far less than cost of doing nothing
- “Do the politicians understand just how difficult it could be? Just how devastating 4,5,6 degrees centigrade would be? I think not yet. Looking back, the Stern Review underestimated the risks and underestimated the damage from inaction”

  (Nick Stern, 12/3/09)

Quantifying impacts

At least 50 significant extreme weather events since 1997:

18 heavy rain / flooding	13 freezing temps / snow
3 tornadoes	10 storms / gales
2 prolonged droughts	5 severe heatwaves

Significant +/- impacts on services & receptors e.g.

- **Roads** (water / heat / closures)
- **Drains**
- **Crime**
- **Disease**
- **Retail**
- **Property** (Fire & Rescue to 544 floods since 2002 / subsidence)
- **Tourism**
- **Trains**
- **Farmers**
- **Schools** (closed due to floods, heat, snow)
- **Rivers** (low flows, toxic algae)
- **Power / phone lines**
- **Grassland fires**
- **Water supply**
- **Elderly** (approx. 130 extra deaths in 2003 heatwave in Kent

Estimated costs so far (excluding Operation Stack) of the order of:

~ £440m to the Kent community	~ £25m to KCC in direct costs

Heatwave event in Kent

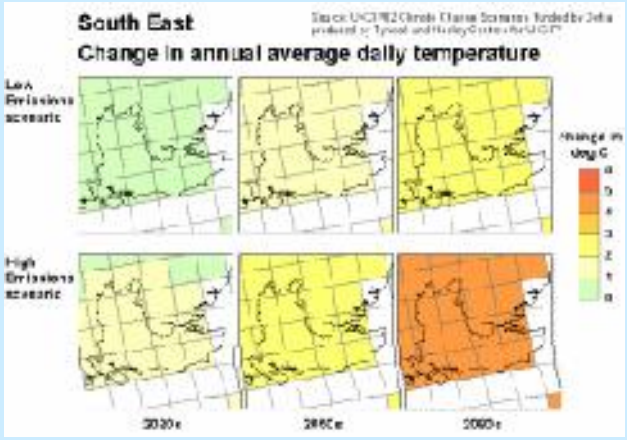
Agriculture	Domestic violence
Natural environment	Retail
Melting roads, buckling tracks	Leisure / Tourism
Schools closures	Waste
Elderly excess deaths	Food poisoning
Arson and grassland fires	Algal blooms
Burglary	Productivity

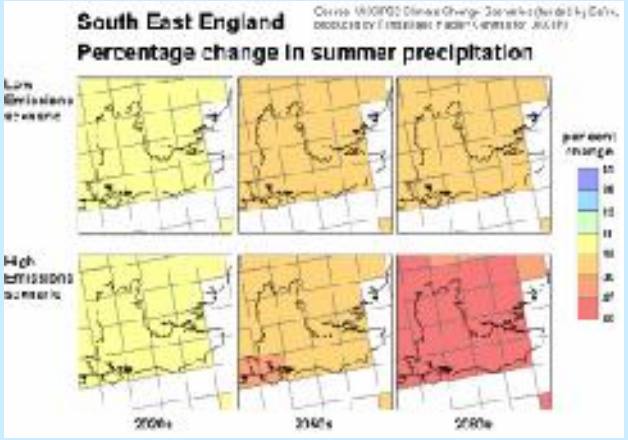
Scoping potential impacts: ask yourself…

- Are you currently affected by weather or climate?
- Do you take decisions with long-term consequences?
- Do you have infrastructure sensitive to changes in weather or climate?
- Are you vulnerable to disruption of external factors?
- Is it critical to maintain continuity of service during extreme weather events?

What is the climate variable?

- Hotter summers
- Drier summers
- Wetter winters
- Milder winters
- Sea level rise
- More intense downpours
- Heat waves
- A combination





For further details on these categories visit the UK Climate Impacts Programme (UKCIP) website http://www.ukcip.org.uk

Activity template

Service area:			Owner:				
1. Climate change trend / weather event	2. Impact on service	3. Potential consequence (threat / opportunity/ambiguous) (why, what/who is affected and how)	5. Timescale (short 0-5yrs / med 5-20yrs / long 20-50yrs/ very long 50-100yrs)	6. Likelihood (1-5)	7. Magnitude of consequence (1-5)	8. Rating (priority for action)	9. Response
	People (clients and staff)						
	Demand						
	Premises						
	Process						
	Finance						
	Logistics						
	Mgmt						

Factors to consider

- **People:** implications for workforce, customers/clients and changing lifestyles
- **Demand:** changing demand for services
- **Premises:** impacts on building design, construction, maintenance and facilities management
- **Process:** impacts on the processes of service delivery
- **Finance:** implications for investment, insurance and stakeholder reputation
- **Logistics:** vulnerability of supply chain, utilities and transport infrastructure
- **Management implications:** how will climate risks and impacts be managed effectively?

How? Decision process

Identify the significant climate variables for the locality

Identify potential threats and opportunities

Estimate the likelihood and consequence of impacts

Identify the most significant impacts

Consider any adaptations in response

- Kent LCLIP helps inform this
- We are rolling out this process across KCC as part of the business planning process for 08/09 onwards

Iterative process: add more detail and work down priority list of impacts over time, linked to continuous monitoring

Adaptive action into Directorate strategies / business plans / personal objectives

Risks into risk registers

Appropriate business continuity plans

Select Committee

POTENTIAL CLIMATE IMPACT	POSSIBLE ADAPTIVE RESPONSE
Increased risk of heat-stress in educational establishments and pollution leading to poorer air quality leading to increase in related illness among children, including breathing difficulties.	Ensure adequate shading and cooling available, ensure water and other treatment measures available
Increased risk of structural damage and disruption to school transport as well as stranded children from extreme weather	Ensure high standards of sustainable construction reflect climate change pressures and that plans for disruption due to extreme weather are in place and up-to-date
Loss of trees and shrubs in school grounds due to drier summers	Plant drought-tolerant plants, harvest rainwater for use on site
Schools at heart of community affected by extreme weather, flood risk, air quality etc	Raise awareness in and beyond the classroom about 'learning to live' with climate change
Longer growing season for plants, need for year-round grass maintenance	Adapt maintenance schedules and resources and minimise energy implications thereof

Key Questions:

- Many issues concerning the man made environment – technological impact and possible solutions
- Contexts for design problems / briefs
- Cross curricular opportunities
- BSF / PFI requirements
- More details now from Oxfam/Practical Action
- To consider – How can we ensure that Design and Technology strongly contributes to this agenda