# Kent Environment Strategy: Rising to the Climate Change Challenge

## Kent's Adaptation Action Plan 2011-2013

*This plan was developed in collaboration with partners across Kent*

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# Executive Summary

The Kent Adaptation Action Plan takes a risk-based approach to the identification of appropriate and proportionate responses to the threats and opportunities of climate change. Partners have sought to identify where actions can be addressed in partnership and resources shared to avoid duplication and the plan is directly linked to the Kent Environment Strategy, delivering on the priority to *manage the impacts of climate change, in particular severe weather events*.

In light of the significant change and budget restrictions across the public sector we have taken a pragmatic, prioritised approach focussing in the first instance on:

- Essential actions where severe weather impacts the safety of Kent residents
- Actions to build capacity within the public sector and increase our understanding of risks and opportunities
- Identification of assets currently susceptible to severe weather impacts with a view to increase resilience
- Decisions with long-term consequences where the outcomes may be affected by a climate different to that which we experience today

We will continue to monitor the impacts of severe weather on Kent through our Severe Weather Impacts Monitoring System (SWIMS) to further develop our understanding of how we are currently impacted by severe weather and what this may mean for us into the future.

The Kent Adaptation Action Plan aims to:

1. **Understand** the risks and opportunities from climate change
2. **Communicate** these with partners and residents
3. **Respond** to our priority risks and opportunities

Our priorities are to build resilience and maximise opportunities within:

***Health & Social Care***
***Biodiversity, Heritage and Natural Environment***
***Kent Highways Services***
***Public Sector Estate***
***Kent Businesses***
***Waste Management***
***Public Sector Staff***
***Kent Communities***
***Planning***

# Introduction

*"Climate Change is one of the biggest challenges the world faces. Tackling and adapting to climate change is a top priority …. local authorities need to recognise both the economic and a social necessity to take steps to protect those areas for which they are responsible."*

**Caroline Spelman, Secretary of State for the Department of Environment, Food and Rural Affairs; September 2010**

- Kent partners have committed to developing an understanding of the impacts climate change will have on our services and to take a risk-based approach to identifying appropriate responses.

- We know that climate change poses a threat to our county which cannot be ignored. In 2009, Kent partners undertook a Local Climate Impacts Profile (LCLIP) to identify Kent's key vulnerabilities to severe weather to help us identify what future climate change could mean for us. Impacts of severe weather events over a ten-year period cost Kent in the region of £440million.

- Partners have sought to identify those actions and opportunities that can be addressed together, with shared resources and in line with the Comprehensive Spending Review and Bold Steps for Kent[1]. However, climate change will potentially affect our services in different ways requiring some actions to be developed individually.

- The Kent Adaptation Action Plan informs (and is informed by) the wider strategies and business plans for Kent. In particular, the plan responds to the Kent Environment Strategy target to **help the public sector, the business community and Kent residents to manage both positive and negative impacts of climate change, including extreme weather events**. Much of the background information on the impacts and drivers relating to climate change are contained within the Environment Strategy and so are not repeated here.

- In addition to these, the plan is directly influenced by Kent's Bold Steps and Vision for Kent principles of growing the economy, tackling disadvantage and putting the citizen in control. We have prioritised actions to ensure that our most vulnerable residents are resilient and we have looked to maximise opportunities for actions to be driven by communities themselves.

- Through greater partnership working and empowering our communities wherever possible, this plan embraces the principles of the Big Society and will hold these at its core. We will **empower our communities** to take ownership of preparing for the implications of climate change whilst supporting **social action** through the development of community-based plans. We will be transparent in our own actions and will expect our residents to hold us to account.

[1] Kent County Council (2010), Bold Steps for Kent. http://kent.gov.uk/your_council/priorities,_policies_and_plans/priorities_and_plans/bold_steps_for_kent.aspx

- The Kent Adaptation Action Plan aims to:

**1. Understand** the risks and opportunities from climate change

**2. Communicate** these with partners and residents

**3. Respond** to our priority risks and opportunities

- Our approach to adaptation is not just about developing new actions, strategies or procedures, but about ensuring that our understanding of the impacts of climate change are built into our current processes to ensure that we are managing these effectively. The process used for development of the action plan is based on that of the UK Climate Impacts Programme adaptation wizard (Figure 1).

- In light of the significant change and budget restrictions across the public sector we have taken a pragmatic, prioritised approach focussing in the first instance on:
  - Essential actions where severe weather impacts the safety of Kent residents
  - Actions to build capacity within the public sector and increase our understanding of risks and opportunities
  - Ensuring the resilience of assets currently susceptible to severe weather impacts
  - Decisions with long-term consequences where the outcomes may be affected by a climate different to that which we experience today

- This approach does not mean that we will not look at longer term/higher cost actions. These are incorporated into the plan with their associated leads and will be monitored and reviewed to ensure that these are delivered as soon as the financial and social costs of carrying out the actions are clearly outweighed by the costs of inaction. Through on-going monitoring of the impacts of severe weather events (SWIMS – Severe Weather Impacts Monitoring System), we will look to further build the evidence base for undertaking these actions.

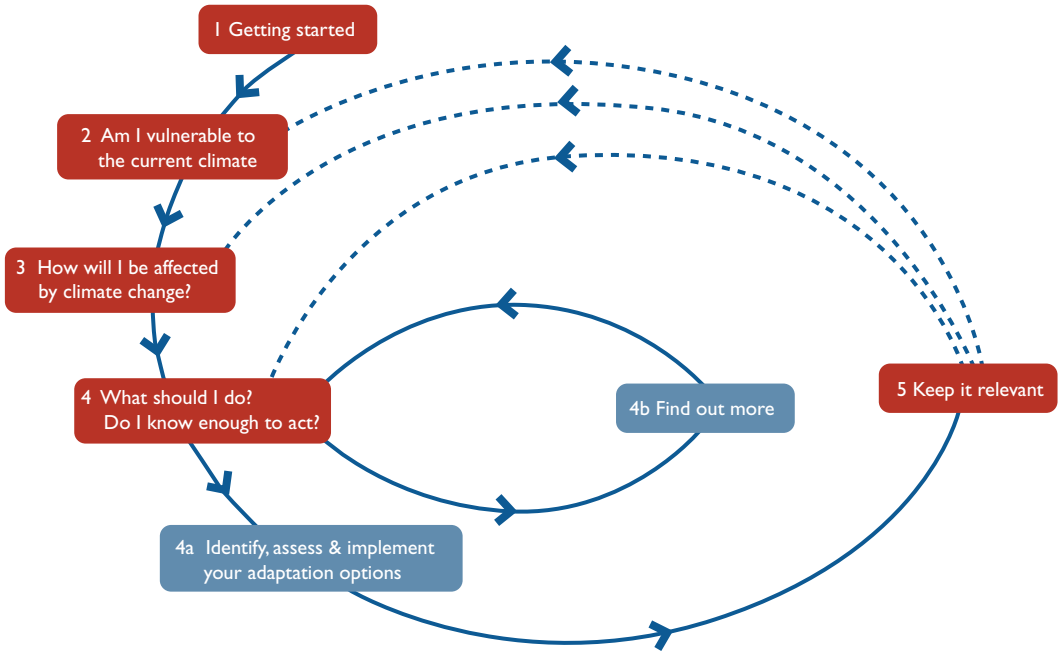


**Figure 1: UKCIP adaptation wizard**

- How we will be impacted by wider issues into the future, such as political instability and increased migration (and in particular how this will impact Kent as a 'gateway' to the UK), although not addressed in the first version of this plan, will need to be regularly monitored and reviewed. This will be triggered initially through a review of action at a national level (based on outputs discussed in the next section) to identify any gaps which could leave Kent vulnerable on a local level.

- The Climate Change Act (2008) introduced a new power for the Secretary of State to direct "reporting authorities" (companies with functions of a public nature) to prepare reports on how they are assessing and acting on the risks and opportunities from a changing climate. This plan therefore goes some way to address the power should local authorities be required to report in the future.

# National Action on adaptation

- The Climate Change Act enhances the UK's ability to adapt to the impact of climate change and establishes the following:
  - a UK wide climate change risk assessment that must take place every five years;
  - a national adaptation programme which must be put in place and reviewed every five years to address the most pressing climate change risks to England;
  - the Government has the power to require 'bodies with functions of a public nature' and 'statutory undertakers' (companies like water and energy utilities) to report on how they have assessed the risks of climate change to their work, and what they are doing to address these risks;
  - the creation of an Adaptation Sub-Committee of the independent Committee on Climate Change in order to oversee progress on the Adapting to Climate Change Programme and advise on the risk assessment.

- All of the above are currently on-going e.g., the first risk assessment will report to Parliament in January 2012 and the Adaptation Sub-Committee of the Committee on Climate Change will advise on the findings in summer 2011. The National Adaptation Programme is also in preparation.

- The Adaptation Sub-Committee report released in September 2010 identified five priorities: land use planning; national infrastructure; natural resources; design and renovation of buildings; emergency planning. These are similar to those we, as a county, have identified through our own research.

- However, the impacts from climate change will not be identical across the UK and so we must develop local responses. Actions addressing national priorities are integrated into our locally-identified themes.

- Local Authorities need to lead the debate on how they are impacted by climate change and ensure that local issues are addressed. How the national programme will impact or support local adaptation planning is still unclear and so is built into the review and monitoring of the Kent adaptation plan.

# Dealing with uncertainty

Taking action to address the impacts of climate change requires us to deal with uncertainty. We are making decisions today that have implications long into the future when the climate may be very different. Through taking a risk-based approach we can manage how we prepare for climate change in a balanced and proportionate way. Research such as the Local Climate Impacts Profile has shown us that the magnitude of the impacts we may face into the future are too great to ignore; severe weather already has a significant impact on the county and preparing for an increase in this is sound risk management.

In this plan we address climate scenarios we can anticipate as being 'more likely' and we build on our experiences of severe weather in the past. For instance, we know that flood risk is likely to increase, we have seen this already and nine out of ten of the hottest years globally on record have occurred since 2000.

# Governance and monitoring

- As stated throughout the plan, it is vital that we ensure minimal duplication of effort and maximum use of resources wherever possible. Clear governance and reporting structure will be developed to ensure that this is the case.

- Actions contained within the plan have identified leads and will be monitored through our standard processes as appropriate including:
  - Business planning
  - Risk management
  - Environmental Management Systems (where applicable)

- In addition to these processes the plan will be monitored in its entirety on an annual basis as part of the requirements of the Kent Environment Strategy.

- A review of the plan will also be triggered by:
  1. Significant change of national or local policy which poses a direct threat or opportunity for delivery of the plan
  2. A development in our understanding of climate change resulting in re-prioritisation of actions
  3. Lessons learnt from severe weather impacts requiring immediate change in actions / priorities as identified through our Severe Weather Impacts Monitoring System (SWIMS)
  4. Changes in current organisational structures and financing

# Emergency Planning

Emergency Planning is a reactive service as and when impacts occur and a key part of preparing for the impacts of a changing climate is ensuring that we have effective plans, training, exercising and resources in place to respond to severe weather events and other emergencies. Kent Resilience Forum (KRF) has developed / is developing plans for Kent partners including:

- Pan-Kent Multi Agency Flood Plan (covering Kent & Medway)
- Local Multi Agency Flood Plans – 12 x Districts and Medway Council
- Heatwave Plan e.g. the Dept. of Health Heatwave Plan for England (2010)
- Reservoir Inundation Plans
- Severe Weather Advisory Group (SWAG) Protocol
- Low Temperatures & Heavy Snow Plan

Specific actions already incorporated into these plans are therefore not repeated here as these are, and will continue to be, reviewed and developed on a regular basis.

Emergency Planning also work with communities to increase resilience as outlined in the KRF Public Warning & Informing Strategy, which details plans to develop a 'Community Resilience Strategy' to promote awareness of, and preparedness for, emergencies in our communities. Integral to this will be a campaign by Local Authorities to encourage Parish and Town Councils to develop 'Community Self-Help' plans. Similarly, the Environment Agency runs a scheme to encourage communities to develop their own flood action plans.

This **adaptation action plan** differs from Emergency Planning in that it takes a proactive approach to longer term climate change and associated increases in severe weather, and looks to save money in the long term through building resilience.[2] The goal of adapting to climate change is to minimise the impacts, maximise the opportunities and therefore reduce the requirements for an emergency response in the first place.

# Our changing climate

*"In autumn 2000, more rain fell on England and Wales than at any time for 230 years. 10,000 homes and businesses were flooded. In 2003, a heatwave gripped Europe. Drought and wildfires put health services and national infrastructure under huge pressure. We can't say for sure that climate change caused these extreme weather events. But the science tells us that as our climate changes, the likelihood of these events increases. In 2004, research suggested human action had doubled the risk of a European heatwave. Using new methods, researchers found that human greenhouse gas emissions may have roughly doubled the chances of the autumn 2000 floods.[3] We can now clearly link extreme events to the rise in man-made greenhouse gases. And we can put a number on how much more likely they are..."*

**Chris Huhne, Secretary of State for Energy and Climate Change, March 2011**

[2] The Stern Review on the Economics of Climate Change
[3] http://www.nature.com/news/2011/110216/full/470316a.html

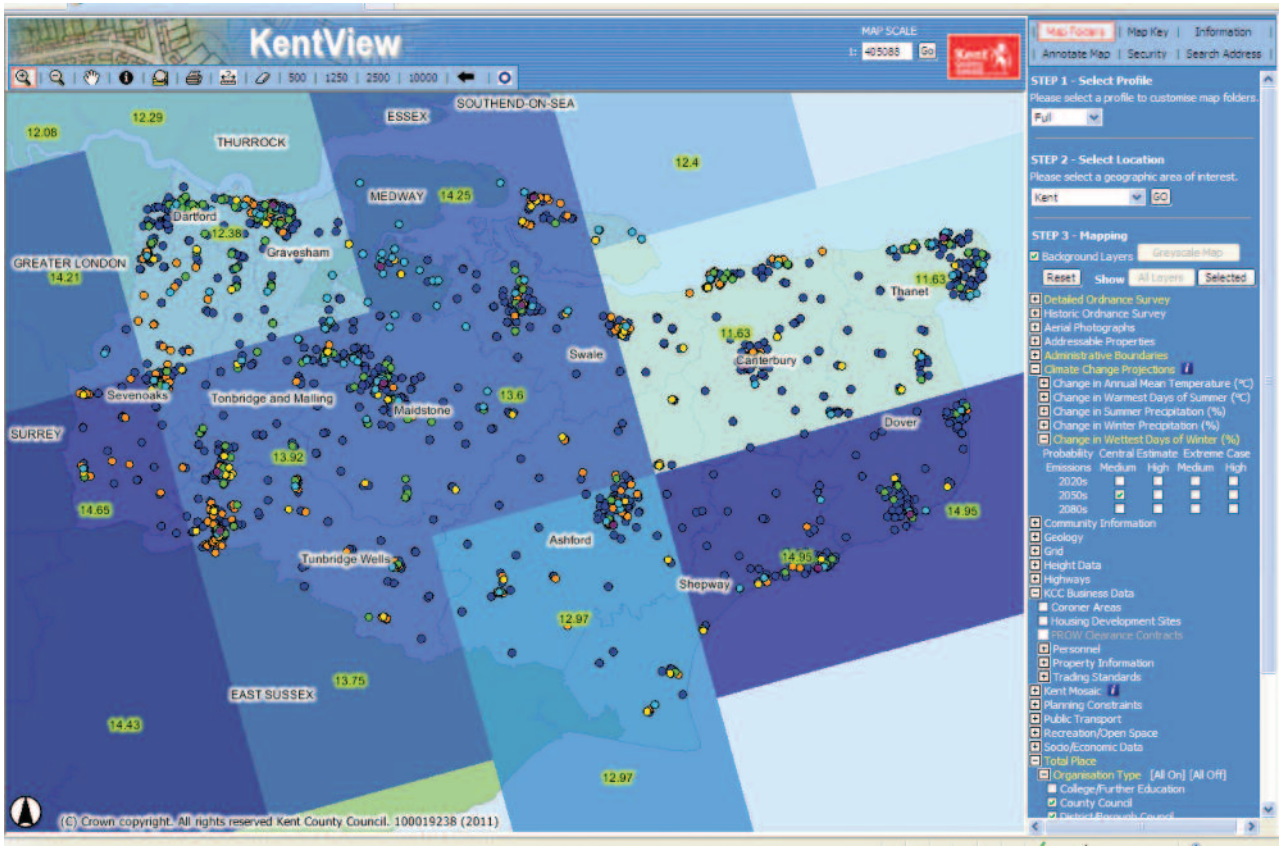


**Figure 2: Location of our public sector estate and percentage change in wettest day (2050s). Taken from KentView**

In June 2009, The UK Climate Projections (UKCP09) were released which provide us with the best science we have to date on climate change in the UK. UKCP09 offers projections of the future climate that is based on the current understanding of the climate system – there may be scientific unknowns that would affect the information provided. Hence UKCP09 should be seen as providing possible projections rather than absolute predictions or forecasts of future climate. Further information on the projections themselves and how they are derived is available on the UK Climate Impacts Programme website[4]

We have mapped these projections on to our current mapping system, KentView, to allow partners to access localised information on what climate change may look like in their area and assess against other factors such as socio-demographics, location of estate and services, heritage sites etc. This tool will shortly be made more widely available to Kent residents.

In summary, the main trends we can expect are:

***Hotter, drier summers***
***Milder, wetter winters***
***Sea level rise***
***More intense downpours***
***Heatwaves***

[4] http://www.ukcip.org.uk/

### *Hotter, drier summers and heat waves*

By 2020 Kent could be facing an average annual 1.4°C temperature increase and 7% less rainfall in summer. By 2050 the temperature could have risen by 2.8°C, and there could be 24% less rainfall. In an extreme case the temperature on the annual hottest day in the 2050s could reach 8 °C higher than those experienced now. Kent is designated as 'an area of water stress' by the Environment Agency and by 2050 the flows in some of our rivers could be reduced by at least 35% as a result of climate change.

Although we will naturally adapt to some of the changes over time, it is these extremes which are likely to have the greatest impact.

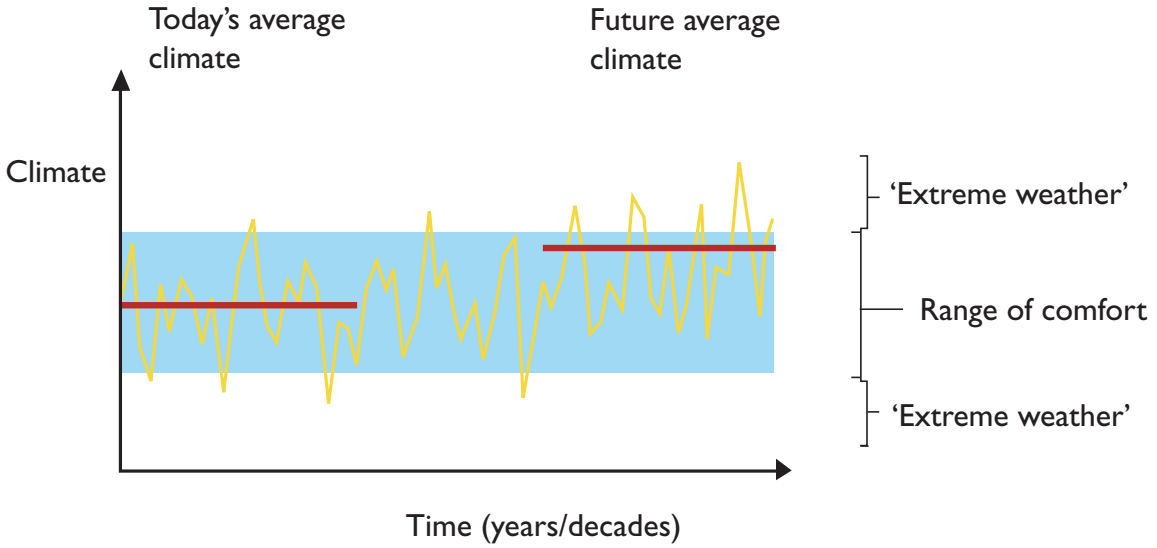


**Figure 3: Extreme weather and climate change (created from theory in Willows & Cornell, 2003)**

**Kent partners are already working together to build resilience to these impacts through:**

- Kent Resilience Forum Drought Plan
- Kent Resilience Forum Heat Wave Plan
- Kent Water Demand Management Group delivery plan

### *Milder, wetter winters and more intense downpours*

By 2020 Kent is likely to see an increase in temperatures of 1.3 °C and a 6% increase in rainfall in winter. By the 2050s, the temperature in winter is likely to increase by 2.2 °C with an increase in rainfall of 14%. However, in an extreme case the rainfall on the wettest day of the year could increase by up to 36% in the county. An obvious implication of this is an increased flood risk, particularly surrounding surface water flooding.

**Kent partners are already working together to build resilience through**:

- Select Committee on Flood Risk Management
- Catchment Flood Management Plans
- Surface Water Management Plans
- Preliminary Flood Risk Assessments
- Single and Multi-Agency Flood Response Plan (Kent Resilience Forum)
- Capital Flood Defence (Environment Agency)
- Shoreline Management Plans
- Strategic Flood Risk Assessments

# Identifying our priorities

To identify our threats and opportunities, workshops were held for senior managers from across the partnership.

Delegates were asked to consider the impacts of the climate scenarios on their service area considering the following themes (taken from BACLIAT tool by UK Climate Impacts Programme[5]):

- **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?

For each impact identified, a risk rating was applied based on current risk management processes carried out by Kent County Council. It is important to note here that use of the terminology 'likely' and 'unlikely' is predominantly used in the context of risk management processes and does not directly align with the climate projections.

[5] UK Business Areas Climate Impacts Assessment Tool
http://www.ukcip.org.uk/index.php?option=com_content&task=view&id=82&Itemid=383

**Table 1: Risk analysis and example impacts taken from Kent County Council Risk Management toolkit**

| Level | Magnitude | Likelihood |
|---|---|---|
| 1 | Minor: Nuisance, small impact on customer service; embarrassment for unit; small financial loss; fine below £5k; | Very unlikely: Has happened rarely / never before; is a highly unlikely climate scenario, even at extremes of climate projections |
| 2 | Moderate: disruptive impact at service unit level; embarrassment for department; noticeable financial loss; fine of £5-25k; slippage to project requiring review to finance or programme | Unlikely: May have happened in the past; unlikely to happen in the next three years |
| 3 | Significant: Disruption to service for more than 3 days; local bad press; substantial damage to one part of a critical building; fines £25-50k; important impact on project deliverables | Possible: Has happened in past; reasonable possibility it will happen as part of climate scenarios |
| 4 | Serious: Disruption to services in one or more departments for 3-5 days; large scandal; extensive damage to a critical building or considerable damage to several buildings from one source; fines £50-150k; RIDDOR reportable major injuries to several people or death of an individual | Likely: Likely to happen at some point in the near future; circumstances occasionally encountered (once/twice per year); within likely range of scenarios |
| 5 | Major: Complete breakdown in service delivery affecting whole organisation; forced resignation of officers / elected members; total loss of a critical building; fines over £150k; death of several people; project failure | Very likely: Current risk almost certain to happen; regularly encountered i.e., daily, weekly, monthly. |

On collation of the outputs our priorities are to build resilience and maximise opportunities within:

***Health & Social Care***
***Biodiversity, Heritage and Natural Environment***
***Kent Highways Services***
***Public Sector Estate***
***Kent Businesses***
***Waste Management***
***Public Sector Staff***
***Kent Communities***
***Planning***

# Options appraisal of actions

Actions contained within the plan have been identified through meetings held with partners working within the priority themes and assessed using the criteria:

1. Length of resilience of response (i.e., long-term or needs to be re-addressed regularly)
2. Affordability
3. Ability to self-sustain (public sector support requirement)
4. Likelihood of success
5. Ability to scale

The full plan is Annex 1 with associated leads, however our key actions for the next two years are given here for all priority areas.

# Partners involved in development of the plan

This plan has been developed with input from partners throughout the process, in particular through identification of impacts and priorities and appraisal of actions.

Those partners involved include:

Kent County Council
Canterbury City Council
Dover District Council
Maidstone Borough Council
Shepway District Council
Thanet District Council
Tunbridge Wells District Council
Business Link Kent
Kent Police
Eastern & Coastal Kent PCT
Public Health Observatory
Kent Biodiversity Partnership
Volunteer Action Network
Ashford Borough Council
Dartford Borough Council
Gravesham Borough Council
Sevenoaks District Council
Swale Borough Council
Tonbridge & Malling Borough Council
Environment Agency
Kent Fire & Rescue Service
Kent Resilience Forum
West Kent PCT
Kent Waste Partnership
Improvement & Efficiency South East

# Cross-cutting actions:

In addition to our identified priority areas, there are a number of actions which will be required to increase our understanding and embed climate change considerations into our organisations. Leads for each action are given in italics, however, it is anticipated that all partners will assist in delivery. Further details are given in the full plan (Annex 1).

## UNDERSTAND

XC1: We will develop an online system to monitor the social and financial impacts of severe weather on our services and roll this out across partners (Severe Weather Impacts Monitoring System - SWIMS). *Kent County Council.*

XC2: We will undertake an annual analysis of incidents requiring multi-agency emergency planning response to ascertain whether climate change may be a contributory factor (e.g., disease, pollution, migration). *Kent County Council*

XC3: We will map the current climate projections (UKCP09) and flood risk on to our current GIS systems to build a picture of priority areas at risk. *Kent County Council.*

XC4: We will continually review best practice both nationally and internationally to inform our on-going planning for preparing for climate change and share this through our Climate Change Network and web portals. *Kent County Council.*

XC5: We will, as part of our rural strategy, research the implications of climate change on food security in the county and develop actions where necessary. *Kent County Council*

## COMMUNICATE

XC7: We will develop guidance for Members and senior managers on integrating climate change in to decision-making and review this regularly. *Kent County Council*

XC8: We will develop an event for elected Members across the county on Sustainability & Climate Change and integrate this into elected Member induction processes. *Kent County Council*

## RESPOND

XC9: We will develop criteria for assessing the sustainability of key decisions. *All partners*

XC11: We will ensure that adapting to climate change is appropriately addressed within our business plans and strategies. This will range from increasing understanding to direct action as appropriate and as understanding grows across our organisations. *All partners*

XC12: We will ensure that climate change and severe weather events are appropriately addressed within all our risk management and business continuity processes (e.g., through use of Mataco software development). *All partners*

XC14: We will develop and maintain the Kent Climate Change Network consisting of officers and key stakeholders in the delivery of climate change targets. *All partners*

XC15: We will develop a Resilience Framework for Water for Kent and develop a co-ordinated approach to the particular risks inherent in the county. *Kent County Council / Environment Agency*

# Health and Social Care

Health is currently severely impacted by severe weather, e.g., daily mortality in South East England increases at temperatures above about 27°C and by 2012, there is a 1 in 40 chance that South-East England will experience a severe heat-wave causing 3,000 immediate heat-related deaths.

The 2008 study, "Growing Old in a Changing Climate[6]" highlights that by 2031 over 50s are expected to represent approximately 41 per cent of the UK population (27 million) and we know that people in old age may be physically, financially and emotionally less resilient to dealing with the effects of a changing climate than the rest of the population.

In addition to this, we know that severe weather results in increased stress and mental health issues with their associated impacts on families and business.

## UNDERSTAND

HSC1: We will review the locations of services, particularly those for vulnerable groups, in relation to flood risk and ensure that those at risk have flood plans in place. *Kent County Council*

HSC2: We will work with our partners in the south east to undertake research into the impacts of climate change on Health & Social Care services and develop recommendations to address changing needs across partners. *TBC*

## COMMUNICATE

HSC4: We will develop a communications strategy to respond to increased risks and opportunities from climate change (e.g., warning and informing, floodline). *Communications sub-group*

HSC5: We will identify and train key frontline service providers and professionals in providing advice for coping in severe weather and a changing climate. *Emergency Planning*

[6] http://sei-international.org/mediamanager/documents/Publications/Future/climate_change_growing_old.pdf

## RESPOND

HSC6: We will work in partnership to raise awareness of the interdependencies between air quality and climate change, health and new development. *District Councils and partners*

HSC7: We will review and update our emergency response for rough sleepers in the county during severe weather and flood events. *District Councils*

HSC8: We will build into our contracting arrangements with external social care providers the requirement to have business continuity plans in place. *Kent County Council*

HSC9: We will review training and demand for Environmental Health Officers during periods of severe weather events and take action where necessary. *District Councils*

HSC10: We will incorporate risk from severe weather events into the positive risk management process for residents. *Kent County Council*

HSC11: We will review and, where required, develop early warning systems for those with respiratory illness during periods of poor air quality. *Public Health / Kent and Medway Air Quality Partnership / Districts Councils*

# Biodiversity, Heritage and the Natural Environment

Biodiversity is one of the first casualties of climate change with effects already being felt by species across the county. The biodiversity of Kent and Medway is amongst the richest of all counties in the UK. Not only is it important in its own right, with many sites of national or international importance, but it contributes substantially to the quality of life of residents and the attractiveness of the county to business and visitors[7].

Research into The Economics of the Environment and Biodiversity has clearly shown how there are significant financial impacts of not protecting biodiversity. E.g., across Europe around 1 in every 6 jobs is dependent on the environment in some way[8]. **In Kent, the Environmental Economy employs around 60,000 people and some 4.4% of all employment in the county is dependent on the environment[9].**

## UNDERSTAND

BI1: We will develop our understanding of the climate change responses, multifunctional value and adaptation capacity of forest ecosystems (Multifor project). *Kent County Council*

BI2: We will review our coastal assets (including biodiversity and heritage) and develop long-term plans in co-ordination with Shoreline Management Plans. *Integrated Coastal Action Working Group; Kent Coastal Network*

BI3: We will review the location of key heritage sites in Kent to identify those at greatest risk from the impacts of climate change. *Kent County Council*

## COMMUNICATE

BI4: We will share the results of the Habitat Change Analysis with all Local Planning Authorities, Districts and other key large land-holding organisations to investigate how (and if) climate change has an adverse impact on the extent and quality of key habitats. *Kent Biodiversity Partnership*

[7] Climate change and the future of Kent's biodiversity (2007); Kent Biodiversity Partnership Steering Group

[8] TEEB for Policy Makers report (2009)

[9] The Environmental Economy of the South East: Final Report, 2005. Prepared by Land Use Consultants, SQW Ltd and Cambridge Econometrics.

## RESPOND

BI5: We will develop and actively promote Biodiversity Opportunity Areas, the spatial framework for the Biodiversity Action Plan. *Kent Biodiversity Partnership / Districts Councils*

BI7: We will research and promote the importance of helping biodiversity to adapt to climate change through spatial planning, building on learning from the BRANCH project. *Kent Biodiversity Partnership / Districts Councils*

BI8: We will develop and utilise techniques to improve our mapping of our most valuable habitats in Kent and work with partners to monitor and conserve these into the future (Arch project). *Kent County Council*

BI9: We will develop and pilot an economic approach to assess and quantify the potential benefits to residents' well-being from the natural environment. *Natural England*

# Kent Highway Services

Kent Highway Services are already significantly impacted by severe weather with costs of over £6million responding to these events over a ten year period. The majority of the costs relating to severe weather are based around freezing temperatures and snow, but flooding and heatwave impacts are on the rise.

Our roads and highways in Kent are fundamental to all partners' capacity to deliver services and so ranks as one of our highest priorities.

## UNDERSTAND

KHS1: We will develop and maintain a climate change risk register for our services, with risks incorporated into our standard risk management processes as appropriate. *Business, Performance & Communication*

KHS2: We will review our current materials and processes for all our assets taking into consideration the implications of climate change and identify replacements where necessary. *Technical Services & Asset Management*

KHS3: We will monitor the impacts of severe weather events on our assets and use this information to inform assessments of maintenance and repair priorities. *Business, Performance & Communication*

## RESPOND

KHS5: We will require our suppliers to demonstrate how they will plan for and proactively manage the impacts of climate change. *Contracts*

KHS6: We will pro-actively manage flood risk across our service, building on recommendations in the strategic flood risk review and in line with our responsibilities as part of the Flood and Water Management Act (2010). *Technical Services & Asset Management*

KHS7: We will ensure that the impacts of climate change are appropriately addressed within our Transport Asset Management Plan (TAMP). *Technical Services & Asset Management*

KHS9: We will recycle and use water harvesting where possible as part of our gully waste management. *Technical Services & Asset Management*

KHS10: We will ensure that our Local Transport Plan considers sustainability issues and the long term implications of climate change. *Countywide Improvements*

KHS11: We will monitor and review the grass cutting season in light of longer growing seasons and take appropriate action if and when required. *Technical Services & Asset Management*

# Kent Communities – Building a resilient Big Society

Communities are a highly impacted group with a high risk rating. In the 2000 floods, Canterbury City Council received over 1300 calls in one day asking for assistance and the costs to Kent were in the region of £20million[10].

Currently, engaging communities with regards to adaptation is limited and there is a significant need to increase this, particularly with regards to communities with high numbers of vulnerable groups. The *National Indicator (NI) 188: Year 1 review and analysis*[11] report also recommends that: "an awareness raising programme with the general public should be considered to increase understanding of, and support for, adaptation activities"

The 'Big Society' approach offers an excellent opportunity to engage with communities around building resilience, understanding and ownership of adaptation activities. Through this plan we will further identify and engage with the voluntary sector and look to build on the activities already underway. For example, community-led planning processes carried out by Action for Communities in rural Kent, or the on-going work of the Volunteer Action Network and KentCAN.

## UNDERSTAND

CO1: We will identify our communities at greatest risk from climate change (and in particular flooding) taking into account UKCP09 and socio-demographics. *Kent County Council/ Environment Agency*

CO3: We will review current levels of insurance across communities in Kent to establish those at highest risk and work with insurers to mitigate costs where possible. *Kent County Council*

[10] Environment Agency - 2000 Flood report for Kent

[11] Davis, A. (October 2009), National Indicator (NI) 188: Year 1 review and summary. In House Policy Consultancy

## COMMUNICATE

CO4: We will review those groups who have the greatest contact with communities and ensure that they are equipped with the right information for community resilience to severe weather (link to HSC5). *Kent County Council / District Councils*

CO5: We will raise awareness within communities through a community conference on climate change adaptation focussing on key priorities, e.g., flooding. *Kent County Council / Environment Agency*

CO6: We will develop clear communications so that individuals are aware of what they can expect from services during severe weather events and clarify responsibilities post-events. *Emergency Planning*

## RESPOND

CO7: We will support and empower communities (prioritising those at greatest risk) to build resilience to the impacts of severe weather through community-led resilience plans. *Kent County Council*

CO8: We will undertake a county-wide Home Energy and Water Efficiency Scheme (in line with Kent Environment Strategy). *Kent County Council and Districts Councils*

# Kent Businesses

Businesses are highly impacted currently through severe weather events, for example in the 2000 flooding, businesses were estimated to have lost £7.9million in Kent. In addition to this, research from Business Link has identified:

- **Heavy rain** resulted in 38% of business having damaged stock and a 22% decrease in visitors
- **Storms:** 44% decrease in stock, 10% decrease in business
- **Heatwaves:** 21% decrease in visitors, 20% reported a negative impact, 14% reported a positive impact (sector dependent)
- 54% of Small and Medium Enterprises (SMEs) in south east (62% in East Kent) experienced impacts from weather events over the two year period of the study [12].

A large number of SMEs across the county have no business continuity in place and 80% of businesses who experience flooding closed within two years as a direct result of the flood event.[13] However, businesses across the county could also benefit from the impacts of climate change, and hotter, drier summers in particular. Tourism saw a 42.8% increase in the county in previous heatwaves with people flocking to Kent's long and varied coastline.

## UNDERSTAND

BU1: We will encourage Kent SMEs to monitor the impacts of severe weather on their business to inform future planning. *Kent Sustainable Business Partnership*

## COMMUNICATE

BU3: We will work with key sectors for which climate change provides significant risks or opportunities to raise awareness of the implications (e.g., opportunities for tourism; threats to water demand and horticulture – See BU2 in plan). *Kent Sustainable Business Partnership / Kent County Council*

[12] Source: SME Business Flood Survey, 2008, Business Link.
[13] Source: SME Business Flood Survey, 2008, Business Link.

## RESPOND

BU4: We will provide online guidance to Kent businesses in the production of business continuity plans and adaptation measures through South East Business Carbon Hub and Kent Prepared. *Low Carbon Futures*

BU5: We will develop and widely promote a free business environmental accreditation scheme incorporating both mitigation and adaptation measures (Steps to Environmental Management - STEM). *Low Carbon Futures*

BU6: We will review business demand for advice and training in risk management processes relating to climate change and severe weather and develop programmes accordingly, e.g., a central resource of expertise across Kent partners. *Low Carbon Futures*

# Public Sector Estate

A significant proportion of our public sector estate will still be around into the future when the climate may be very different to that we experience today. This will have implications for the materials we use, assets we maintain and decisions we make. Our estate has also felt some of the greatest costs. For example, floods in 2000 resulted in costs to Tonbridge swimming pool of £900,000 when it needed to be closed down for 14 weeks. Subsequent flooding measures were put in place costing £250,000. In 2007, flooding of KCC's buildings cost £106,000 in insurance and our capacity to deliver services has been significantly reduced during flood events; in 2000, 82 schools closed resulting in a loss of 1158 school days.

## UNDERSTAND

PSE1: We will review the risks posed to the public sector estate from all impacts of climate change through identifying locations and service type and mapping against climate projections and flood risk. *All partners*

## COMMUNICATE

PSE2: We will develop guidance and recommendations on measures (and associated costs and benefits) which can be taken to build resilience across the public sector estate e.g., grey water harvesting, passive cooling, insulation, sustainable drainage etc. *Kent Design Guide*

PSE3: We will undertake a programme of training and guidance on the impacts of climate change for building / facility managers. *Kent County Council (building on PSE 2). All partners*

## RESPOND

PSE4: We will review our drainage capacity across our estate and implement / increase sustainable drainage systems, clearing and maintenance programmes as appropriate. *All partners*

PSE5: We will research the implications of climate change on our insurance and work with companies to mitigate these. *Kent County Council*

PSE6: We will review and re-locate where necessary key ICT infrastructure to ensure that impacts of over-heating and flooding are addressed. *All partners*

PSE8: When retrofitting and maintaining our estate we will determine opportunities for passive cooling and other adaptation measures to be implemented at the same time (and in co-ordination with other opportunities such as renewables). *All partners*

PSE9: In commissioning new buildings we will integrate climate change into the design phase. *All partners (supported by action PSE3)*

PSE10: We will audit planting regimes around the public sector estate and review the need for changing species, watering and cutting frequency whilst ensuring no negative impacts on biodiversity *TBC*

PSE11: We will work in partnership to review the opportunities from Feed-in Tariffs across the public sector estate and develop recommendations. *All partners*

# Public Sector Staff

From the Local Climate Impacts Profile (LCLIP), workshops and meetings we know that staff productivity, health and safety and absenteeism have been highlighted as significant areas of concern. During the 2000 floods, one District received 1300 calls for assistance in one day when staff were unable to access work and suffering from impacts in their own communities.

Five main issues have been identified:

1. Staff ability to access work
2. Staff awareness of the impacts of climate change
3. H&S issues in the work environment
4. Decreased productivity
5. Need for staff to cover priority areas resulting in low staffing levels in others

## UNDERSTAND

PSS1: We will develop resources for officers to identify risks and opportunities in their business units. We will use the outputs to further inform our wider planning. *Kent County Council / all partners*

## COMMUNICATE

PSS2: We will develop staff communications to ensure that our officers are able to cope during severe weather events both in their homes and at work. *Communications sub-group*

PSS3: We will identify and train key officers in the use of the climate change projections (UKCP09) to provide a central resource of expertise for the public sector. *Kent County Council / all partners*

## RESPOND

PSS4: We will encourage and increase flexible working (e.g., through use of IT and teleconferencing) to assist in business continuity during severe weather events. *All partners*

PSS5: We will train staff to assist in ensuring continuity of service during severe weather events. *All partners*

PSS6: We will review the Health & Safety of our staff, and in particular those based outdoors for long periods of time and look to develop criteria for staff comfort during sustained high temperatures. *All partners*

# Waste Management

Severe weather events in the past have impacted waste management through lost collection days (KCC deal with 3,000 tonnes waste per day) and an increase in complaints in hotter weather due to odour and pests.

## COMMUNICATE

WA2: We will clarify and widely communicate responsibilities for activities post severe weather events. *Kent Waste Managers Group*

WA3: We will prepare lists of waste types and how they will be affected by climate change and associated severe weather and use this to develop Kent-wide advance communication advising residents on what to do with their waste in differing conditions. We will use this information to identify any potential changes to waste facilities required *Kent Waste Managers Group*

## RESPOND

WA4: We will ensure that refuse/recycling/cleansing contracts contain clauses to require contractors to provide resource to assist in emergencies. *Kent Waste Managers Group*

WA5: We will develop cross-boundary (South East Seven) arrangements for waste disposal after severe events. *South East Seven*

WA6: We will ensure that climate change impacts are appropriately addressed within our Waste and Minerals Development Framework. *Kent County Council*

# Planning

Responsibilities for planning vary across the county making county-wide actions difficult to identify. In addition, the building regulations are currently under review nationally and the Government will shortly be producing a national planning policy framework. This theme will therefore be reviewed on a regular basis in line with monitoring processes laid out previously; the adaptation action plan is an iterative document and will need to be regularly reviewed and assessed against our increased understanding and awareness of climate change and the policy environment in which we operate.

This is not to say actions are not already underway, many are already being addressed within individual Local Development Frameworks, particularly in regard to flooding, and these are available through individual partner authorities. It is also anticipated that individual planning departments will address climate change issues relevant to their area in line with increased local responsibilities ( also see actions PSS1, PSS3, XC2, XC5, XC9).

However, there are some county-wide actions in the short term which can help Kent to build its understanding of the impacts of climate change and appropriate actions, enabling resilient decision making:

### UNDERSTAND

PL1: We will strengthen and update the Kent Design Guide as a common guidance and evidence base for public and private sector development in Kent. *Kent Design*

### RESPOND

PL2: We will build capacity in the public and private sector by raising awareness, training and sharing expertise on sustainable planning and development based on PL1. *Kent Design*

# Glossary of key terms

| Term | Definition |
|---|---|
| Adaptation | The Intergovernmental Panel on Climate Change (IPCC) defines adaptation as: "adjustments in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderate harm or exploit beneficial opportunities". |
| Climate Change | Climate refers to the average weather experienced over a long period, typically 30 years. The Earth's climate has changed many times in response to natural causes – the term climate change usually refers to changes that have occurred since the early 1900s[14]. |
| CSR | Comprehensive Spending Review |
| KentView | Kent View uses GIS software to allow users to query and analyse data for the county via digital mapping http://extranet7.kent.gov.uk/kentview/ |
| LCLIP | A Local Climate Impacts Profile measures the impacts of severe weather events on an organisation in the recent past. |
| Local Development Frameworks | Local Development Frameworks are like a 'folder' containing all relevant documents prepared by the district councils. These documents outline the spatial planning strategy for the local area. |
| Likelihood of risk | chance of the risk occurring |
| Magnitude of risk | what harm might result from the risk |
| Mitigation | Mitigation refers to actions that reduce our contribution to the causes of climate change. This means reducing our emissions of greenhouse gases, such as carbon dioxide (CO2). |
| Resilience | The ability of a social or natural system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity to adapt to stress and change. |
| SWIMS | Kent's Severe Weather Impact Monitoring System is an online system where individuals can upload the impacts of severe weather events on their organisation or business unit. |
| UKCIP | UK Climate Impacts Programme |
| UKCP09 | UK Climate Projections 2009 |

[14] http://www.ukcip.org.uk/essentials/what-is-climate-change/

| | |
|---|---|
| Vulnerability | Vulnerability is the degree to which something is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes. |
| Water stress | Water stress is related to the amount of water available per person for a given area, both now and in the future. An area of serious water stress is defined as an area where the current household demand for water is a high proportion of the current effective rainfall or, the future household demand for water is likely to be a high proportion of the effective rainfall available to meet that demand. |

| Theme | Priority | Ref | Action | Time to implement* | Why is this needed? | Lead | Delivery partners | Co-dependencies | Cost of action | Cost of in-action | Actions already in place |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cross-Cutting | **Understanding the impacts** | | | | | | | | | | |
| | Medium | XC1 | We will develop an online system to monitor the social and financial impacts of severe weather on our services and roll this out across partners | Short | All impacts from severe weather assessed; greater monitoring to develop understanding of the potential impacts from climate change; informed planning and cost:benefit analyses | KCC | Kent Resilience Forum; Districts | Flood & Water Management Bill (2010); | Medium | Medium | Severe Weather Impacts Monitoring System (SWIMS) in development as an online tool for all partners |
| | Medium | XC2 | We will undertake an annual analysis of incidents requiring multi-agency emergency planning response to ascertain whether climate change may be a contributory factor (e.g., disease, pollution, migration). | On-going | Building understanding of the impacts of climate change and on-going monitoring | KCC | Kent Resilience Forum | | Low | Medium | Severe Weather Impacts Monitoring System (SWIMS) in development as an online tool for all partners |
| | Medium | XC3 | We will map the current climate projections (UKCP09) and flood risk on to our current GIS systems to build a picture of priority areas at risk | Complete | Currently not fully aware of what climate change means on a local level | KCC | | Your Nearest; Flood & Water Management Bill; | Low | Medium | KentView |
| | Medium | CC4 | We will continually review best practice both nationally and internationally to inform our on-going planning for preparing for climate change and share this through our Climate Change Network and web portals | Short | Climate change adaptation and awareness is a rapidly moving field and a central resource of information can save time and better inform our decision making | KCC | All | | Low | Medium | Climate Change Adaptation library |
| | Medium | XC5 | We will, as part of our rural strategy, research the implications of climate change on food security in the county and develop actions where necessary | Short | The implications of climate change on our food security is already a known concern nationally but we need to develop our understanding on a local level | KCC | | Rural strategy; Assessment of foods reliant on irrigation | Medium | Medium | Evidence base completed |
| | Medium | XC6 | We will undertake a Local Climate Impacts Profile across Kent partners to determine our current vulnerability to severe weather events | Complete | To better understand the impacts of climate change, we need to have an understanding of our current vulnerability are to severe weather | KCC | All | | Medium | Medium | Partnership LCLIP complete and outputs on Kent Connects |
| | **Communication and training** | | | | | | | | | | |
| | High | XC7 | We will develop guidance for Members and senior managers on integrating climate change in to decision-making and review this regularly | Complete | All actions and decisions need support from elected members and senior management; decisions may result in projects which will be impacted by climate change into the future | KCC | | Kent Environment Strategy; Climate Change Act (2008) | Low | High | Climate Change: A pack for Kent's decision makers |

* Short = <2 years, medium = 2-5 years, long term = 5+ years.

| Theme | Priority | Ref | Action | Time to implement* | Why is this needed? | Lead | Delivery partners | Co-dependencies | Cost of action | Cost of in-action | Actions already in place |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cross-Cutting | High | XC8 | We will develop an event for elected Members on Sustainability & Climate Change and integrate this into elected Member induction processes | Short | Elected Member support is integral to the delivery of actions; Member support is cited as one of the key requirements nationally for undertaking any actions. | KCC | TBC | Kent Environment Strategy | Low | High | |
| | **Responding and taking action** | | | | | | | | | | |
| | High | XC9 | We will develop criteria for assessing the sustainability of key decisions | Short | Key decisions often result in long-term products which will be impacted by climate change and could therefore require significant retrospective investment if not considered up front | ALL | ALL | Kent Environment Strategy | Low | High | |
| | High | XC10 | We will review the need for a 'critical fund' for reacting to severe weather events across the public sector and ensure that our 'reserve funds' as outlined in the Pitt Review are maintained | Medium | Increased costs of reacting to more frequent severe weather events | TBC | TBC | Flood and Water Management Act (2010); | High | High | |
| | High | XC11 | We will ensure that adapting to climate change is appropriately addressed within our business plans and strategies. This will range from increasing understanding to direct action as appropriate and as understanding grows across our organisations. | Short | Kent Forum acknowledge that climate change will impact across our services; integration of risks and opportunities into business processes to aid resilience of service delivery | ALL | ALL, EA | Kent Environment Strategy; Climate Change Act (2008) | Low | High | Currently integrated into most partner's plans |
| | High | XC12 | We will ensure that climate change and severe weather events are appropriately addressed within all our risk management and business continuity processes (e.g., through use of Mataco software development) | Short | The risks of severe weather events are already addressed within our community risk register; climate change is known to be a risk to our service delivery | ALL | ALL | Risk management processes; Civil Contingencies Act (2004) | Low | High | Recent event held in November 2009 for risk managers across the Kent Partnership. Presentations on Kent Connects |
| | Medium | XC13 | We will ensure our call centres have the capability to respond to increased demand during and following severe weather events | Short | One of the main impacts identified through the LCLIP project has been an increased pressure on call centres, mainly resulting in an impact on reputation. It has already been found that some areas have had advice services overloaded at times when staff have been unable to get to work | ALL | ALL | | Medium | Medium | |
| | Medium | XC14 | We will develop and maintain the Kent Climate Change Network consisting of officers and key stakeholders in the reduction of emissions and preparing for climate change | Short | A significant number of actions will require cross-organisational working; sharing best practice; raising awareness | KCC | ALL | | Low | Medium | In place |

| Theme | Priority | Ref | Action | Time to implement* | Why is this needed? | Lead | Delivery partners | Co-dependencies | Cost of action | Cost of in-action | Actions already in place |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cross-Cutting | High | XC15 | We will develop a *Resilience Framework for Water* for Kent and develop a co-ordinated approach to the particular risks inherent in the county | Short | Looking to the future, it is likely that Kent will have an increasing economic stake in the sound management of local water issues. We need to anticipate an increasing role for KCC by developing our understanding of the potential risks and identifying actions to address them. | KCC | EA; Water companies ; Districts | | Medium | High | |

| Theme | Priority | Ref | Action | Time to implement* | Why is this needed? | Lead | Delivery partners | Co-dependencies | Cost of action | Cost of in-action | Actions already in place |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Health & Social Care | **Understanding the impacts** | | | | | | | | | | |
| | High | HSC1 | We will review the locations of services and vulnerable groups in relation to flood risk and ensure that those at risk have flood plans in place (e.g., care homes, gypsy and traveller sites etc) | Short | We need to ensure continuity of service during severe weather events and that vulnerable groups are able to cope with clear plans in place. | KCC | EA; Districts | Emergency Planning and EA both looking into this; | Medium | High | Care homes, flood risk and UKCP09 projections mapped on to Kent View; EA have worked with two care homes for flood plans |
| | Medium | HSC2 | We will work with our partners in the south east to undertake research into the impacts of climate change on Health & Social Care services and develop recommendations to address changing needs across partners. | Short | Although we have insight into many of the impacts of climate change, this could be further interrogated for identification of long-term actions | Climate South East | All | Total Place | Medium | Medium | LCLIP outputs, UKCP09 projections; Health & Social care event outputs |
| | Medium | HSC3 | We will, in partnership with biodiversity theme, identify and monitor where increased risk may emerge from invasive species and associated disease and plan accordingly. | Medium | Species are already known to be moving with climate change and so there is an increased risk of invasive species and associated diseases. Cuts to Trading Standards and Defra's Animal Health may result in increased risk through reduced monitoring. | Animal Health; | Emergency Planning; Kent Biodiversity Partnership; Trading Standards; Defra | Kent Biodiversity Strategy; Public Health Strategy | Low | High | ARCH project; |
| | **Communication and training** | | | | | | | | | | |
| | Medium | HSC4 | We will develop a communications strategy to respond to increased risks and opportunities from climate change, e.g., warning and informing of health risks associated with heatwaves; food safety in increased temperatures; flood advice sheets | Short | Increase in RTCs already identified across the county due to wetter driving conditions; increase in excess deaths during heatwaves; increase in food poisoning in hotter temperatures; mental and physical health impacts of flooding | Adaptation communications sub-group (TBC) | ALL; EA | Kent Environment Strategy; Public Health Strategy; Emergency Planning; EA | Medium | Medium | Public Warning & Informing strategy (Emergency Planning); Public Health Champions Programme; KHS Network management communications |
| | Medium | HSC5 | We will identify and train key frontline service providers and professionals in providing advice for coping in severe weather and a changing climate. | Short | Our frontline service providers have contact with those who are most at risk from severe weather and climate change (and who may not respond to mailings, internet etc.) | Emergency Planning; | Social Services; Voluntary Sector; EA | Workforce strategies; ; Kent Environment Strategy | Low | Medium | Half day workshops on business continuity undertaken; Annual conference; 2 seminars for Kent & Medway Care Alliance |

| Theme | Priority | Ref | Action | Time to implement* | Why is this needed? | Lead | Delivery partners | Co-dependencies | Cost of action | Cost of in-action | Actions already in place |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Health & Social Care | **Responding and taking action** | | | | | | | | | | |
| | Medium | HSC6 | We will work in partnership to raise awareness of the interdependencies between air quality and climate change, health and new development | Short | We know that air quality is impacted by hotter, drier temperatures and this has a knock-on effect on health, particularly with regards to respiratory disease | ALL | District Councils; EA; KCC; Public Health | Public Health Strategy | Low | Medium | Kent & Medway Air Quality Partnership workshop held in October 2010 |
| | High | HSC7 | We will review and update our emergency response for rough sleepers in the county during severe weather and flood events | Short | Climate change and severe weather does not impact all equally. We know that vulnerable groups are particularly at risk | Kent Housing Group | Porchlight | | Low | High | Identifying vulnerable people in an emergency plan |
| | Medium | HSC8 | We will build into our contracting arrangements with external social care providers the requirements to have business continuity plans in place | Short | Need to ensure continuation of service and appropriate responses to severe weather and climate change as vulnerable groups are particularly affected | Kent Adult Social Services | | | Low | High | |
| | Medium | HSC9 | We will review training and demand for Environmental Health Officers during periods of severe weather events and take action where necessary | Short (Review) Medium (Action) | Environmental Health has been identified as one of the most highly impacted service areas through increased demand already seen in all severe weather events. | Environ-mental Health | | | Low | Medium | Climate Change and its Health Implications |
| | Medium | HSC 10 | We will incorporate the risk from severe weather events into the positive risk management process for residents | Short | All climate scenarios and severe weather events could impact Kent residents in their homes; opportunity to build resilience in community | KASS Policy | | Supporting Independence; ALfA | Low | Medium | |
| | Medium | HSC 11 | We will review and, where required, develop early warning systems for those with respiratory illness during periods of poor air quality | Short | During periods of lower air quality (which climate change and weather systems influence), those with respiratory illnesses are disproportionately affected | Public Health; | Emergency Planning; Kent & Medway Air Quality Partnership ; Met Office | | Medium | Medium | |

| Theme | Priority | Ref | Action | Time to implement* | Why is this needed? | Lead | Delivery partners | Co-dependencies | Cost of action | Cost of in-action | Actions already in place |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Biodiversity, Heritage & Natural Environment | **Understanding the impacts** | | | | | | | | | | |
| | Medium | BI1 | We will develop our understanding of the climate change responses, multifunctional value and adaptation capacity of forest ecosystems. (Multifor) | Short | Climate Change will impact forest ecosystems through a variety of means e.g., changing species and opportunities from longer growing seasons | AONB | ALL | Multifor | High | High | Multifor project funded through Interreg |
| | High | BI2 | We will review our coastal assets (including biodiversity and heritage) and develop long-term plans in co-ordination with Shoreline Management Plans. | Medium | Kent as a county has one of the longest coastlines in the UK. In light of potential (and on-going) coastal squeeze, we need to ensure our coastal assets are managed effectively. | Integrated Coastal Action Working Group - TBC | English Heritage | Shoreline management plans; Coastal erosion risk maps; Thames Estuary 2100; Greater Thames Estuary Coastal Habitat Management Plan (CHAMP) | Medium | High | Coastal volunteers; Kent Coastal Network |
| | Medium | BI3 | We will review the location of key heritage sites in Kent to identify those at greatest risk from the impacts of climate | Short | Heritage sites across Kent may be increasingly at risk from the impacts of climate change | Kent County Council (Heritage) | | | Low | Medium | Cross-reference with BI2 |
| | **Communication and training** | | | | | | | | | | |
| | Medium | BI4 | Communicate results of Habitat Change Analysis to key stakeholders including local planning authorities, districts and large land-holding organisations | Short | Provision of base information to investigate how (and if) climate change is causing an adverse effect on the extent and quality of priority habitats | KBAP | Districts; KCC | | Low | High | HCA already being undertaken |
| | **Responding and taking action** | | | | | | | | | | |
| | High | BI5 | We will develop and actively promote Biodiversity Opportunity Areas, the spatial framework for the Biodiversity Action Plan | Short | To ensure that all Districts (DC and Spatial Planning depts) are aware of the opportunities for enhansing biodiversity in their areas. | KBAP | | | Medium | High | 16 BOAS have been identified in which action should be focussed and packs developed to explain and promote them |
| | High | BI6 | We will establish functional habitat areas and wildlife networks in Biodiversity Opportunity Areas that support local landscape character | Medium / Long | To facilitate species movement and improve habitat resilience | KBAP | Districts; KCC | Kent Environment Strategy; | High | High | |

| Theme | Priority | Ref | Action | Time to implement* | Why is this needed? | Lead | Delivery partners | Co-dependencies | Cost of action | Cost of in-action | Actions already in place |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Biodiversity, Heritage & Natural Environment | High | BI7 | We will research and promote the importance of helping biodiversity to adapt to climate change through spatial planning | Complete | To facilitate species movement and improve habitat resilience | KCC (Branch) | | | Medium | High | Branch project complete |
| | High | BI8 | We will develop and utilise techniques to improve our mapping of our most valuable habitats in Kent and work with partners to monitor and conserve these habitats into the future (ARCH) | Medium | To aquire up to date data on key habitats extent, level of land cover and habitat change in the past 10-20 years | KCC (ARCH) | | ARCH project | High | High | ARCH Project under way. |
| | Medium | BI9 | We will develop and pilot an economic approach to assess and quantify the potential benefits to residents' well being from the natural environment | Medium | Building the business case in light of future losses due to climate change | Natural England | KBAP | Kent Environment Strategy; | Medium | Medium | |
| | Medium | BI10 | Deliver initiatives in the Kent area that enable people to more readily access green space and the historic environment such as Explore Kent, outdoor learning and volunteering | Medium | Increasing outdoor lifestyles due to increased temperatures | TBC | TBC | Action HSC8 | High | High | |

| Theme | Priority | Ref | Action | Time to implement* | Why is this needed? | Lead | Co-dependencies | Cost of action | Cost of in-action | Actions already in place |
|---|---|---|---|---|---|---|---|---|---|---|
| Kent Highway Services | **Understanding the impacts** | | | | | | | | | |
| | High | KHS1 | We will develop and maintain a climate change risk register for our services, with risks incorporated into our standard risk management processes as appropriate | Short | All climate scenarios | Business Performance Team | | Low | High | Some risks already addressed within risk register for severe weather |
| | High | KHS2 | We will review our current materials and processes for all our assets taking into consideration the implications of climate change and identify replacements where necessary | Medium | All climate scenarios. Some of our assets will be around into the future and susceptible to increased risks from climate change. | Head of Programmed Works & Maintenance Operations | | Medium | High | Asset Management Plans in development |
| | Medium | KHS3 | We will monitor the impacts of severe weather events on our assets and use this information to inform assessments of maintenance and repair priorities | Short | Our current understanding of the impacts of severe weather events is limited and could be improved | Head of Programmed Works | | Low | Medium | SWIMS |
| | **Communication and training** | | | | | | | | | |
| | Medium | KHS4 | We will work in partnership to inform the public about road drainage cleansing activities | Short | Increased risk of flooding resulting in potential increase in complaints and reputational damage. | Head of Programmed Works | Surface Waster Flood Management; Select Committee on Flood Risk | Low | Medium | Action included within Select Committee Flood Risk Plan |
| | **Responding and taking action** | | | | | | | | | |
| | High | KHS5 | We will require our suppliers to demonstrate how they will plan for and proactively manage the impacts of climate change | Short | The impacts of climate change will affect the capacity of our suppliers to deliver, the materials we use and how we deliver services | Commercial Manager | | Low | High | New contracts contain the requirement for this |
| | High | KHS6 | We will proactively manage flood risk across our service building on recommendations in the strategic flood risk review and in line with our responsibilities within the Flood and Water Management Act (2010) | Short | More intense downpours and wetter winters are likely into the future and therefore are likely to increase flood risk in the county. Flooding has an impact on the delivery of all services for all partners across the county. Between 1999 and 2003, flood response cost KHS £931,880. | All Service Heads | Flood and Water Management Act (2010); Strategic Flood Risk Review; Pitt Review; Select Committee on Flooding | High | High | Strategic Flood Risk Review; Surface Water Management Plan in development for Kent. |

| Theme | Priority | Ref | Action | Time to implement* | Why is this needed? | Lead | Co-dependencies | Cost of action | Cost of in-action | Actions already in place |
|---|---|---|---|---|---|---|---|---|---|---|
| Kent Highway Services | High | KHS7 | We will ensure that the impacts of climate change are appropriately addressed within our Transport Asset Management Plan (TAMP) taking action where needed | Short | All climate scenarios will impact our transport assets and severe weather events in the past have resulted in significant costs and impacts. | Head of Programmed Works | | Varies | High | |
| | High | KHS8 | We will require all new build and refurbishments to meet BREEAM 'very good' standard as part of the Capital Build Programmes | Short | Current new builds will be impacted by the impacts of climate change over their lifespan | Commercial Manager | | High | High | This is currently a requirement |
| | High | KHS9 | We will recycle and use water harvesting where possible as part of our gully waste management | Short | Twin pressures of increased flood risk impacting gully waste management and increased risk of drought. | Head of Programmed Works | Surface Waster Flood Management; Select Committee on Flood Risk | High | High | Action included in Select Committee Flood Risk plan; gully clearance budget increase from £1.8m to £2.8m |
| | High | KHS 10 | We will ensure that our Local Transport Plan 3 considers sustainability issues including the long-term implications of climate change | Short | This is a long term plan with implications likely to be impacted by climate change scenarios into the future | Head of Highway Transportation | Regeneration Framework; Kent Environment Strategy; | | | Scoping paper commissioned on impact of climate change on LTP3 |
| | Medium | KHS 11 | We will monitor and review the grass cutting season in light of longer growing seasons and take appropriate action if and when required | Short | Growing seasons have already increased across the county resulting in knock-on costs across partners | Head of Programmed works | | Medium | Medium | |

| Theme | Priority | Ref | Action | Time to implement* | Why is this needed? | Lead | Delivery partners | Co-dependencies | Cost of action | Cost of in-action | Actions already in place |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Communities | **Understanding the impacts** | | | | | | | | | | |
| | High | CO1 | We will identify our communities at greatest risk from climate change (and in particular flooding) taking into account UKCP09 and socio-demographics | Medium | We know that some communities will suffer greater impacts than others, e.g., those with a high proportion of vulnerable groups or in areas at risk from flooding. | EA | KCC; Coastal authorities; Integrated Coastal Working Group | Localism; Emergency Planning; EA; Safer, Stronger Communities; Coastal erosion risk maps; Strategic flood risk planning | Medium | High | KentView maps projections and socio-demographics; Coastal Communities 2150 interreg bid in place; Project completed on mapping vulnerabilities and climate change |
| | Low | CO2 | We will review our rest centres with relation to their locations and capacity during severe weather and climate change | Short | We need to ensure that there are safe areas for Kent residents during periods of extreme weather | Kent Resilience Forum | Districts | Emergency Planning | Medium | High | Rest centres already identified across the county so low risk currently |
| | High | CO3 | We will review current levels of insurance across communities in Kent to establish those at highest risk and work with insurers to mitigate costs where possible | Short | Insurance costs are likely to increase into the future turning off individuals in the community who need it most | KCC | | | High | High | |
| | **Communication and training** | | | | | | | | | | |
| | Medium | CO4 | We will review those groups who have the greatest contact with communities and ensure that they are equipped with the right information for community resilience to severe weather (link to HSC5) | Short | Many groups and individuals work with community groups and are trusted members of the community. | KCC | KentCAN; Districts; Voluntary sector; Libraries and Archives | Warning and Informing Strategy (Emergency Planning) | Low | Medium | Community Wardens already provide advice and support which can be developed; volunteer centres and libraries have networks which could be utilised |
| | Low | CO5 | We will raise awareness within communities through a community conference on climate change adaptation focussing on key priorities, e.g., flooding. | Short | Raising awareness of risk to build resilience in communities through support in preparation of plans | KCC | EA; ACRK; Districts; Emergency Planning | Big Society; Localism | Low | Medium | Conference previously held on climate change and active community groups identified |
| | Medium | CO6 | We will develop clear communications so that individuals are aware of what they can expect from services during severe weather events and clarify responsibilities post-events | Short | Managing expectations | Emergency Planning | Adaptation communi-cations sub-group | Warning and Informing Strategy (Emergency Planning) | Low | Medium | |

| Theme | Priority | Ref | Action | Time to implement* | Why is this needed? | Lead | Delivery partners | Co-dependencies | Cost of action | Cost of in-action | Actions already in place |
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| Communities | **Responding and taking action** | | | | | | | | | | |
| | High | CO7 | We will support and empower communities (prioritising those at greatest risk) to build resilience to the impacts of severe weather through community-led resilience plans | Medium | Building capacity within communities themselves as the experts in how they are impacted by severe weather. Resilience plans can incorporate longer term planning. | Emergency Planning | KCC; Districts; Kent CAN; EA | Localism; Emergency Planning; EA; Big Society; CC2150 project; Action with Communities in Rural Kent (ACRK) Community-led planning | Low | High | Community Emergency Plan template developed, roll out September 2010.;<br><br>ACRK Community-led planning |
| | High | CO8 / KES | We will undertake a county-wide home energy and water efficiency scheme | On-going | Increased risk from drought into the future and linking up programmes. Need for energy saving. | KCC | Districts; HIAs; KFRS | Fuel Poverty; ; Kent Environment Strategy; Kent Housing Strategy | High | High | Phase 1 currently underway targeting four areas. |
| | High | CO9 | We will develop exemplar projects in the county for water efficiency | Medium | Building capacity and awareness across the county | Kent Water Demand Management Group | | | High | High | Savings on Tap (Ashford); Kent Area-based retrofitting programme; Savings at Home |
| | Medium | CO10 | We will develop and trial a scheme with community volunteers to provide advice and assistance to communities and in particular self-identified vulnerable members of the community. | Medium | All climate impacts and severe weather events will have a significant impact on communities and in particular vulnerable groups; increase localism and community ownership. | KentCAN? | KCC; Districts; EA | Localism; Big Society | Medium | Medium | |

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| Businesses (SMEs) | **Understanding the impacts** | | | | | | | | | |
| | Medium | BU1 | We will encourage Kent SMEs to monitor the impacts of severe weather on their business to inform future planning | Short | We know businesses are significantly impacted across the county by severe weather events with 62% of businesses in East Kent reporting impacts from severe weather over a two year period. | KSBP | KCC; Emergency Planning | Low | Medium | SWIMS; Business Link research |
| | Medium | BU2 | We will develop an evidence base on water demand for irrigation and engage with key horticultural businesses to develop plans as appropriate | Short | Water demand for horticulture is now the fastest growing sector for Kent's largest water supply company. This demand peaks during drought periods and the water is not returned to the environment after use. The sector contributes strongly to the Kent economy | KCC | Kent Rural Board; EA; Water companies | Low | High | |
| | **Communication and training** | | | | | | | | | |
| | Medium | BU3 | We will work with key sectors for which climate change provides significant risks or opportunities to raise awareness of the implications (e.g., opportunities for tourism and risks for horticulture and water use) | Short / Medium | During a heatwave in 2003, there was a 42% increase in tourism. 67% of the area of Kent is agricultural land contributing £600m to the Kent economy | KCC | EA; Districts; | Low/ | Medium | Coastal Communities 2150 |
| | **Responding and taking action** | | | | | | | | | |
| | High | BU4 | We will provide online guidance to Kent businesses in the production of business continuity plans and adaptation measures through *South East Business Carbon Hub* and *Kent Prepared* websites | Short | Currently businesses are not addressing climate change risk across sectors as well as wider business continuity issues; 54% of SMEs in the south east (62% in East Kent) experienced impacts from severe weather over a w-year study. In the same study 38% reported damaged stock from storms | Low Carbon Futures Programme (KCC) | Emergency Planning | Medium | High | South East Business Carbon Hub; Business Support Centre; Kent Prepared |
| | Medium | BU5 | We will develop and widely promote a free business environmental accreditation scheme incorporating both mitigation and adaptation measures (Steps to Environmental Management - STEM) | Short | We need to consider our suppliers capability to provide continuity of service | Low Carbon Futures Programme | ALL | Medium | Low | Already in development through Low Carbon Futures project |
| | High | BU6 | We will review business demand for advice and training in risk management processes relating to climate change and severe weather and develop programmes accordingly, e.g., a central resource of expertise across Kent partners | Short | A large number of SMEs across the county have no business continuity in place and 80% of businesses who experience flooding closing within two years as a direct result of the flood event. In addition, heat waves result in a dramatic decline in business for nearly all sectors except tourism. | Low Carbon Futures Programme | Local Partnerships (e.g., Canterbury for Business etc.) | Medium | High | |

| Theme | Priority | Ref | Action | Time to implement* | Why is this needed? | Lead | Delivery partners | Co-dependencies | Cost of action | Cost of in-action | Actions already in place |
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| Public Sector Estate | **Understanding the impacts** | | | | | | | | | | |
| | High | PSE1 | We will review the risks posed to the public sector estate from climate change through identifying locations and service type and mapping against climate projections and flood risk. | Short | Need to build understanding of estate and opportunities available | ALL | ALL | Strategic Flood Risk Review | Low | High | Locations already known and mapping available through KentView |
| | **Communication and training** | | | | | | | | | | |
| | High | PSE2 | We will develop guidance and recommendations on measures (and associated costs and benefits) which can be taken to build resilience across the public sector estate e.g., grey water harvesting, passive cooling, insulation, sustainable urban drainage etc. | Short | All climate projections; development of clear business cases for action; improving understanding and collating information on technologies and actions available | KCC (SILCS) | ALL | Kent Design Guide; Guidance from CIRIA, BSRIA, BRE etc. | Low | High | North East RIEP project; Kent Design Guide; Tonbridge & Malling guidance notes |
| | Medium | PSE3 | We will undertake a programme of training and guidance on the impacts of climate change for building / facility managers | Short | All climate projections; building capacity for delivery of actions | KCC | ALL | Kent Design Guide | Low | Medium | This is already in development for KCC around energy efficiency and so can be expanded and shared across partners |
| | **Responding and taking action** | | | | | | | | | | |
| | High | PSE4 | We will review our drainage capacity across our estate and implement / increase sustainable drainage systems, clearing and maintenance programmes as appropriate | Short | Increased flood risk across the county | ALL | ALL | Surface Water Management Plans; Strategic Flood Risk Review | Medium | High | |
| | High | PSE5 | We will research the implications of climate change on our insurance and work with companies to mitigate these | Short | Likely increase in insurance costs in light of increased frequency of severe weather events; litigation risks from buildings not structurally sounds; increased risk of falling trees damaging property; | KCC | ALL | | Medium | High | |
| | High | PSE6 | We will review and re-locate where necessary key ICT infrastructure to ensure that impacts of over-heating and flooding are addressed | Short (Review) Medium (Action) | Known past flooding events impacting ICT; equipment susceptible to over-heating; business continuity | ALL | ALL | ICT strategy | Medium | High | |

| Theme | Priority | Ref | Action | Time to implement* | Why is this needed? | Lead | Delivery partners | Co-dependencies | Cost of action | Cost of in-action | Actions already in place |
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| Public Sector Estate | High | PSE7 | We will identify where estate can be rationalised or building use altered across the public sector and ensure that the impacts of climate change are addressed | Medium | Need to deliver efficiencies; all climate projections impacting estate and this needs to be considered in long term planning | Total Place | | Kent Environment Strategy; Total Place | High | High | |
| | High | PSE8 | When retrofitting and maintaining our estate we will determine opportunities for passive cooling and other adaptation measures to be implemented at the same time (and in co-ordination with other opportunities such as renewables). | Short | All climate projections will impact buildings; increased litigation risk; safety of staff and service users | ALL | ALL | | Medium | High | This already occurs for some partners |
| | High | PSE9 | In commissioning new buildings we will integrate climate change considerations into the design phase. | TBC | New buildings will be impacted by climate change over their lifetime including increased flood risk, heatwaves, drought etc. The costs of retrofitting buildings after events is generally higher than if incorporated into build at outset. | ALL (guidance through PSE3) | ALL | Kent Design Guide; Sustainable Construction Policy (KCC); BREEAM; Select Committee on Renewable Energy | Low | High | |
| | Medium | PSE 10 | We will audit planting regimes around the public sector estate and review the need for changing species, watering and cutting frequency | Short | Growing period already known to have increased; more drought conditions impacting watering regimes | TBC | TBC | | Medium | Medium | |
| | High | PSE 11 | We will work in partnership to review the opportunities from Feed-in Tariffs across the public sector estate and develop recommendations and programme of retrofitting across Kent partners | Short | Risk of loss of utilities and energy supply; maximising opportunities from hotter summers; money which could be utilised for other measures | ALL | ALL | Select Committee on Renewable Energy; Low Carbon Sector Strategy; Kent Environment Strategy | High | High | |

| Theme | Priority | Ref | Action | Time to implement* | Why is this needed? | Lead | Delivery partners | Co-dependencies | Cost of action | Cost of in-action | Actions already in place |
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| Public Sector Staff | **Understanding the impacts** | | | | | | | | | | |
| | High | PSS1 | We will develop resources for officers to generate actions for their business units identifying risks and opportunities of climate change. We will use the outputs to further inform our wider planning. | Short | We have addressed priorities here as identified through meetings with senior management, this action will ensure that ALL teams have assessed climate risks and opportunities | KCC | ALL | | Low | High | Green Guardian toolkit; presentation and spreadsheet for senior managers all on Kent Connects |
| | **Communication and training** | | | | | | | | | | |
| | Medium | PSS2 | We will develop staff communications to ensure that our officers are able to cope during severe weather events both in their homes and at work | Short | Severe weather events – staff unable to get to work; impacts on health and mental health through impacts at home | Adaptation communication sub-group | ALL | National Heatwave Plan; Business Continuity | Low – Medium | High | This is an action within the Personnel & Development Action Plan (KCC) |
| | Medium | PSS3 | We will identify and train key officers in the use of the climate change projections (UKCP09) to provide a central resource of expertise for the public sector | Short | All climate impacts – building knowledge | KCC | ALL | | Low | Low | Some officers from across the partnership have undergone UKCIP training |
| | **Responding and taking action** | | | | | | | | | | |
| | High | PSS4 | We will encourage and increase flexible working (e.g., through use of IT and teleconferencing) to assist in business continuity during severe weather events. | Short | Severe weather impacts – those partners who have historically coped best have had flexible working in place | ALL | ALL | Office Transformation Strategy (KCC); Better Workplaces; ; FaME | Medium | Medium | Already encouraged in most partner organisations |
| | Medium | PSS5 | We will train staff to assist in ensuring continuity of essential services during severe weather events | Medium | Severe weather events – staff currently being utilised from across services with minimal training and resulting in loss in delivery of others | ALL | ALL | | Medium | Medium | |
| | Medium | PSS6 | We will review and monitor the Health & Safety of our staff and in particular those based outdoors for long periods of time. We will look to develop criteria for staff comfort addressing increased working temperatures | Short | All climate scenarios could impact the health and safety of our staff | ALL | ALL | Investors in People; H&S | Low | Medium | |

| Theme | Priority | Ref | Action | Time to implement* | Why is this needed? | Lead | Delivery partners | Co-dependencies | Cost of action | Cost of in-action | Actions already in place |
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| Waste | **Understanding the impacts** | | | | | | | | | | |
| | Medium | WA1 | We will review how climate change may impact waste types and what changes to waste facilities may be required in the future e.g., increased green waste collection and treatment | Medium | Climate change is likely to result in longer growing seasons | Kent Waste Managers Group | Kent Waste Partnership | | Dependent on review | Medium | |
| | **Communication and training** | | | | | | | | | | |
| | Medium | WA2 | We will clarify and widely communicate responsibilities for activities post-events | Short | To ensure efficient use of resources and that costs are correctly apportioned | Kent Waste Managers Group | WCAs; WDA; KRF | | Low | High | |
| | Medium | WA3 | We will prepare lists of waste types and how they will be affected by climate change and associated severe weather and use this to develop Kent-wide advance communication advising residents on what to do with their waste in differing conditions | Short | Needed in advance to advise residents and waste disposal outlets. Mainly flooding, but could consider other weather impacts. improved response; being prepared; assistance to residents | Kent Waste Managers Group | Disticts; KCC; Medway | | Low | Medium | |
| | **Responding and taking action** | | | | | | | | | | |
| | Medium | WA4 | We will ensure that refuse/recycling/ cleansing contracts contain clauses that require contractors to make resources available to deal with emergencies | Short | In order to provide adequate and flexible resources to help with any impact / emergency and costs incurred | Kent Waste Managers Group | All WCAs and WDA. | | Low | Medium | |
| | Medium | WA5 | We will develop cross-boundary working / arrangements for waste disposal after severe events (SE7 project?) | Short | Need to maximise resource and capacity post events; Economics of scale; joint procurement for one off events | South East Seven | Disposal authorities ; KCC; Medway and others in SE area | First activity would be to share existing contracts, consider adequacy and then produce ideal wording | Medium | Medium | |
| | Medium | WA6 | We will ensure that climate change impacts are appropriately addressed within our Waste and Mineral Development Framework | Short | The framework is a long term document with outcomes which could be impacted by a changing climate and severe weather events | KCC | | | Medium | High | A sustainability appraisal has been carried out for the framework incorporating climate change |

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