

LCLIP – local climate impacts profile

Information on historical extreme weather events¹ and their impacts

What is a local climate impacts profile?

A local climate impacts profile is a tailored process that highlights an area's vulnerability to severe weather events and how these events affect local communities as well as local authority assets, infrastructure and capacity to deliver services. It helps a local area to assess its exposure to weather and climate.

Why did we do one?

At the time, the latest climate change projections suggested that south east England - including Portsmouth – was likely to experience more heavy rainfall, higher temperatures in the summer months and more extreme variability, such as storms and gales. We wanted to understand how we had been impacted in the past by these types of events, so that we could better understand how and where we could build resilience within our service delivery, for future events of this type.

This work would also inform the next stage of the wider work to build resilience to climate change – carrying out risk assessments of climate change – by helping us to understand what the types of risk could be.

What did we do?

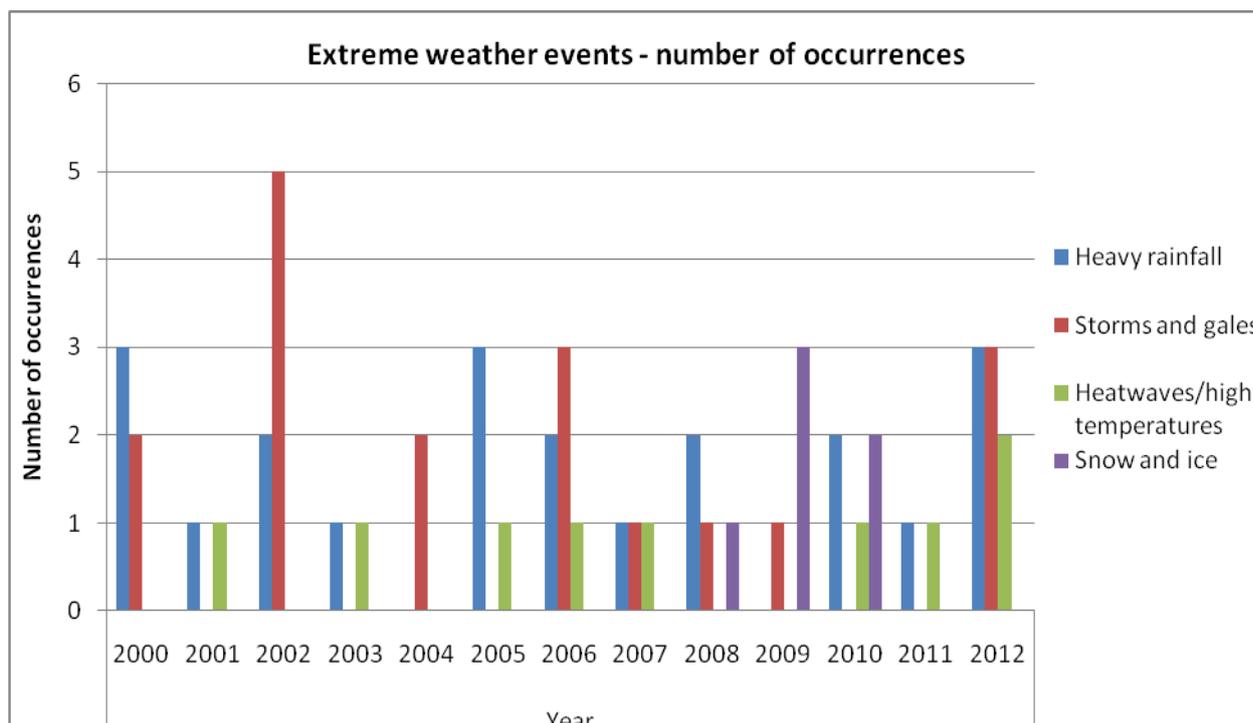
During December 2008 and June 2009, research was undertaken to find out whether the city had been affected by three types of extreme weather – heavy rainfall; storms and gales and unseasonably high temperatures and heatwaves.

Desktop research was undertaken – looking through newspapers – to find out how many events of this type had occurred in the city (see appendix one). Discussions were then had with various frontline services across the council, to find out how these recorded events had an impact on their service delivery (see appendix two).

Following on from this work, it was recommended that a log should be kept of when extreme weather events occur in the city, and so these have now been included in the analysis – including episodes of heavy snow. Appendix one details every episode of extreme weather that has been recorded from September 2000 to date [July 2012]. The next few pages give an overview of what was found out through the research.

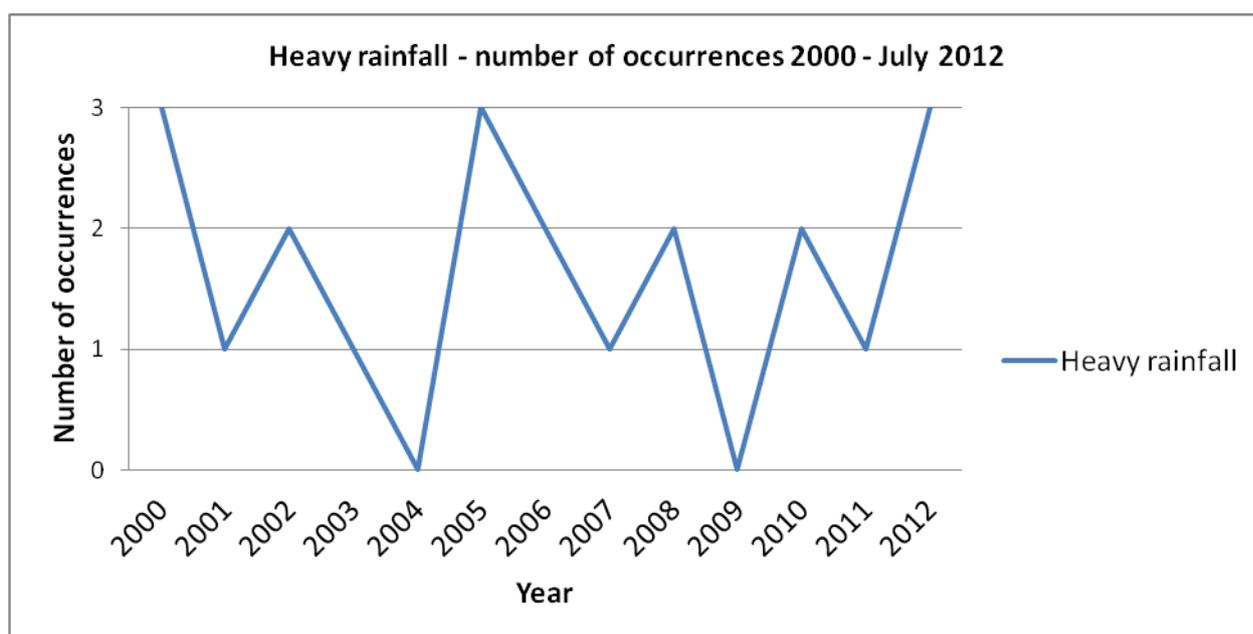
¹ Extreme weather event is defined as an event that results in negative impacts on buildings, people, infrastructure, and cost the city resource as a result

Extreme weather events – an overview



The above graph shows the number of times different types of extreme weather events have affected the city between 2000 and up to July 2012. What is clear is that no year between 2000 and 2012 has been free of an extreme weather event. The following graphs look in more detail at those weather extremes.

Heavy rainfall



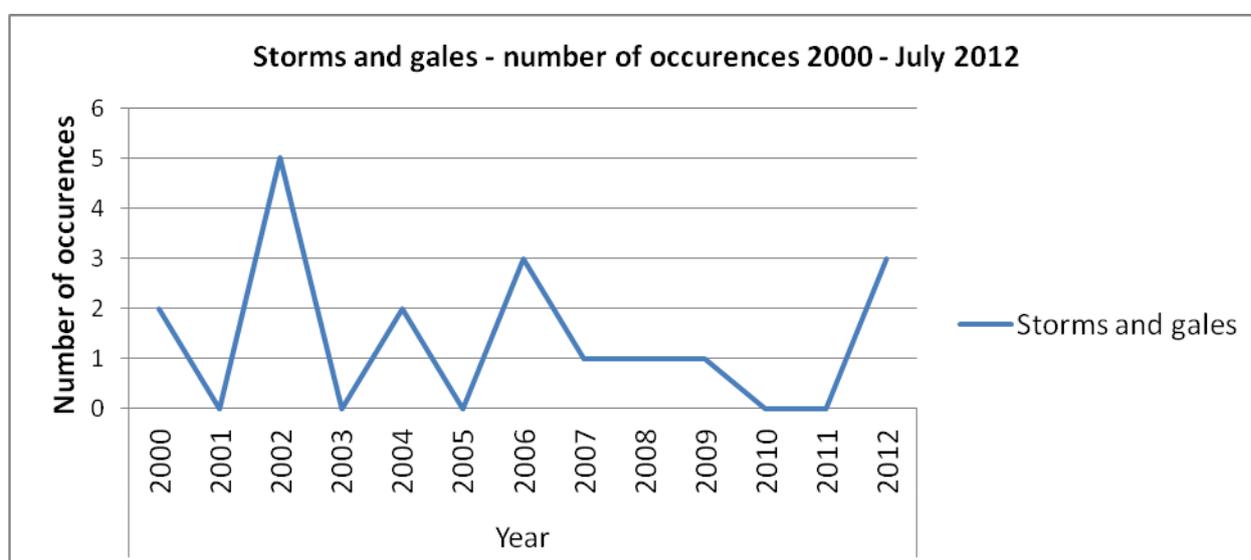
Heavy rainfall that resulted in flooding somewhere within the city, has occurred in 11 of the 13 years that was researched – 2004 and 2009 were the exception.

In September 2000 large parts of Portsmouth flooded as a result of heavy rainfall. In **3 hours, 60 mm** of rain fell (the average for the whole month), and as a result Eastney pumping station failed. This caused sewage to escape into floodwater from the city's drains.

There was citywide flooding, including many parts of Southsea, and many people were evacuated from their homes. PCC had to evacuate its offices when floods cut off power to the Civic offices. 21 streets in Southsea and 114 properties were affected. Some areas were under 5 feet of water, and many residents were evacuated by boat.

At other times, a combination of heavy rainfall and high spring tides has resulted in coastal flooding in some areas of the city. In March 2008, the tide reached **5.53 metres** (2.8 metres above sea level). It was the highest tide in Portsmouth since December 1989. The town quay flooded, and 60cm water was recorded opposite the East Street slipway. Clarence Parade was also flooded.

Storms and gales



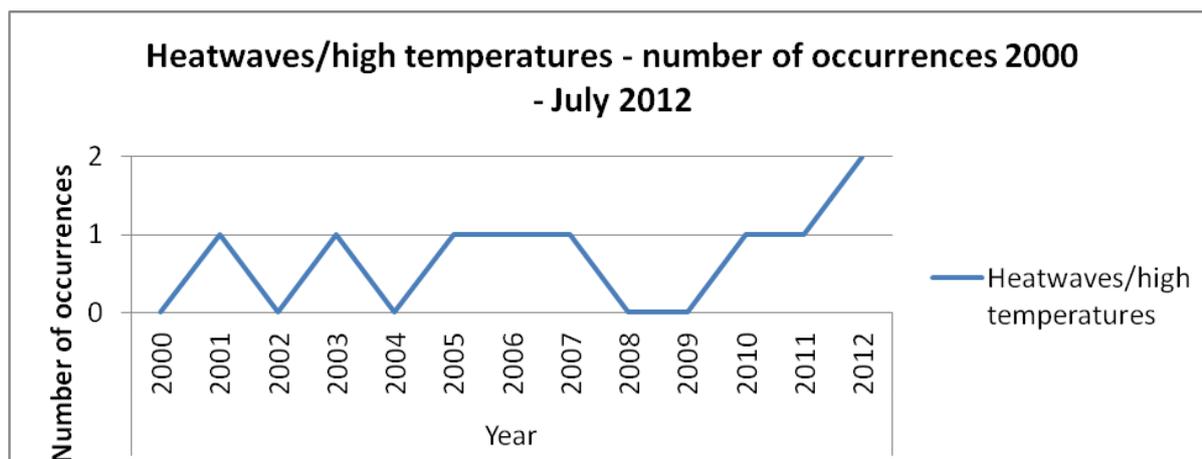
In the last 13 years, Portsmouth has been subject to over 17 'storms and gales'. These events have caused extensive damage to buildings across the city, including schools, residential properties and the Civic Offices.

Episodes of high wind speeds (such as in March 2008 where wind speeds reached **70-80 m.p.h**) damage property and cause disruption to channel and hovercraft crossings. In October 2002, wind speeds reached up to **70 m.p.h** around the area, and a tornado was reported in Portchester, where 20 properties were damaged, and 100 properties were affected. In Southsea, £15,245 of damage was caused as a result of these storm force winds.

The total cost of insurance claims paid as a result of storms and severe weather are:

August 2000 – July 2012 = £750,157.95

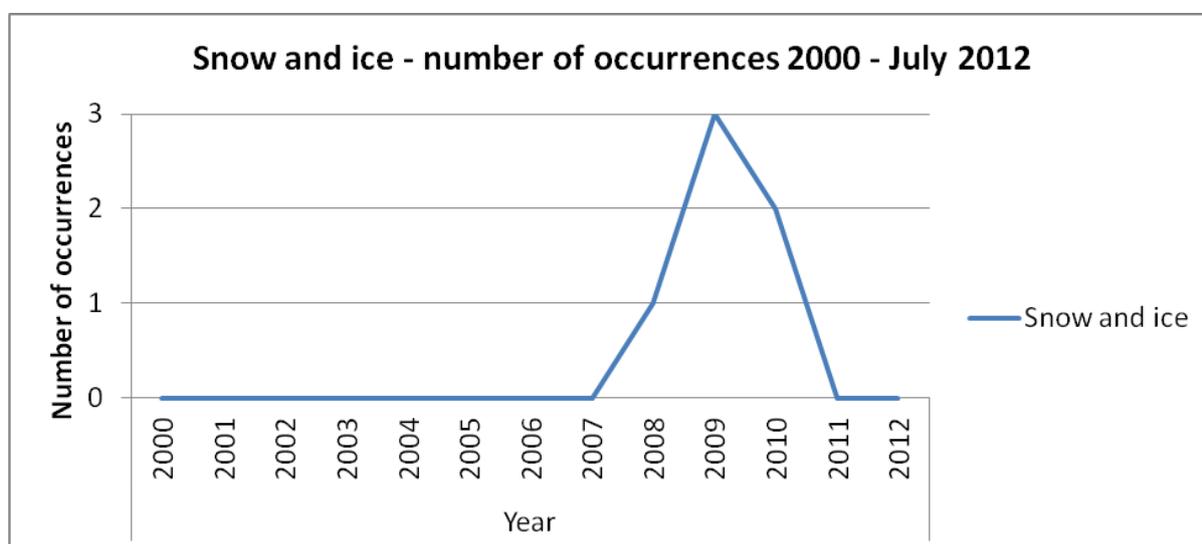
High temperatures and heatwaves



High temperatures – either unseasonably warm weather or heatwaves do also occur fairly regularly. Both types can have impacts on our more vulnerable residents, and can lead to indirect problems such as an increase in anti-social behaviour.

Portsmouth has experienced 2 major heatwaves in recent years, the first in August 2003 and the second in July 2006. In 2003, temperatures reached **36.3°C**, and some schools closed early or all day on the hottest day. In July 2006 temperatures reached between **30-32°C**. Again, schools closed early including Northern Parade & Waterside, and approximately 40 children were ill with heat-related illnesses. Ambulance calls also increased by a third.

Snow and ice



There have been three incidences of snow in the last four years, which had major impacts on public service delivery across the city. In 2010, Portsmouth was subject to two major incidences of snow and ice, the first hit the city in January of 2010, and disrupted services across the city for over the week – rubbish collections were cancelled; QA hospital was difficult to access; adult day centres were closed, and many city council staff were unable to get in.

All schools closed for one day in the January snow – the only day in Portsmouth history where all schools closed. It took almost a week for all schools to be up and running again

These episodes highlighted a number of areas where services weren't being delivered as a result of extreme weather events, and provide some real evidence for why we should be adapting to extreme weather events.

Meetings with services

Meetings were held with council services that deliver services to the public and residents, to better understand how they had been impacted in the past by extreme weather; how they normally respond to such events, and any ways in which they are planning to prepare for such events in the future.

More detail is available in appendix two; however a number of key messages came out of those discussions, which will be important to look at in more detail as we move forward with this work:

1. The council's response to extreme weather events in the past has often been reactive. If the same type of event happens again, we are just as likely to respond reactively to that, rather than changing service delivery and business processes to prevent the same impacts happening again.
2. The basic response to the consequences of an extreme event is to improve emergency procedures and have robust business continuity plans in place. Currently, not all services have an up to date business continuity plan.
3. No information is gathered on a regular basis to record when extreme weather events occur or what the impacts of these are. This makes it more difficult to understand how we are vulnerable to extreme weather events and future climate change. It also makes it more difficult to evidence the costs.
4. There are a number of impacts from past extreme weather events, which occur more regularly, and appear to cause more disruption. These are key areas to look at in more detail. The impacts are:
 - Gridlock in the city and failure of public transport
 - Reliance on partners
 - Closure of frontline services e.g. schools and day centres
 - Increased workload and an increased demand for services
 - Impacts on health and wellbeing
 - Damage to buildings and infrastructure

Appendix one – all recorded extreme events in the city

Time period	Weather event and primary damage	Description
August 2000	Heavy rainfall resulting in flooding	Resulted in sewerage being leaked and damage to a school in Southsea
September 2000	Storms and gales, and heavy rainfall, resulting in flash flooding	Resulted in Eastney pumping station being flooded, and 20 streets in Southsea flooded with sewerage
October 2000	Storms and gales; heavy rainfall resulting in damage to property and flooding	Flooding in Copnor road, London road, and Fratton road. Damage to trees across city and some roofs damaged.
August 2001	Heavy rainfall resulting in flooding	City-wide flooding & damage to property. 8ft waves on South Parade Pier.
October 2001	High temperatures	Higher than average temperatures for October
January 2002	Gale force winds	Damage to signs. Rear wall of Keppel's Head collapsed.
February 2002	Heavy rainfall & gales resulting in high tides and strong sea currents	Prevented the HMS Ocean from leaving Portsmouth. 3 windows blown out at Baltic House.
March 2002	High winds	Roof blown off at a block in St. Edmund's School.
September 2002	Heavy rain and high winds	Damage to trees and hoardings. Burrfields Road flooded.
October 2002	Tornado and gale force winds, resulting in damage to property	20 properties damaged by the tornado, and 100 properties affected
August 2003	High temperatures/heatwave resulting in health impacts	Temperatures reached 36.3C, schools closed early/closed all day
October 2003	Heavy rainfall resulting in flooding	Flooding on Copnor and Milton Roads.
January 2004	Thunder & lightening	
June 2004	Storms and gales, resulting in high tides and strong sea currents	P&O ferries cancelled. Tree across road in Milton Road.
June 2005	Heavy rainfall resulting in flooding	Storm damage to properties/buildings across the city: city-centre, Hilsea, Cosham, Eastney, Portsdown, Buckland, Paulsgrove. Copnor Road flooded. Southern Water pumping station hit by lightening (old Portsmouth).
August 2005	High temperatures/heatwave followed by	
August 2005	Heavy rainfall & lightening resulting in flooding and damage to property	Fareham Holiday Inn hit by lightening. Copnor Road flooded.
September 2005	Heavy rainfall & lightening resulting in flooding and damage to property	Sewerage flooding into Cosham fire station; houses in Portsmouth hit by lightening
July 2006	High temperatures/heatwave resulting in grassfires	Cornfield fire in Leigh Park; schools closed; approximately 40 children ill with heat-related illnesses
September 2006	Storms and gales; heavy rainfall resulting in flooding	Roads in Southsea were impassable, including Fratton Road. Flooding gate breached, nine schools closed including Flying Bull and St. Edmund's.
October 2006	Heavy rainfall resulting in coastal flooding – high tides	Flood watch, five out of nine floodgates closed

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November 2006	Tornado; thunder & lightening, resulting in damage to property	Houses damaged in Fareham
December 2006	High winds resulting in damage to property	Eastney residents evacuated. Copnor road flooded.
January 2007	Storms and gales resulting in coastal erosion & damage to property	Houses/roofs in Southsea collapsed; tiles ripped off South Parade Pier; significant shingle loss opposite Naval Memorial.
March 2007	Heavy rainfall resulting in high tides	Flood watch - five out of nine floodgates closed
April 2007	High temperatures/ heatwave	Average temperatures reached 25C, superstores such as ASDA had higher than normal sales on BBQ's etc
March 2008	Storms and gales; heavy rainfall resulting in flooding and high tides	Flooding in Clarence Parade (Southsea), flats down in city centre (Winston Churchill Avenue); 60cm water opposite East Street slipway, town quay flooded
April 2008	Snow	Lifeguards called out to three times to boats which were lost - Solent Coastguard issues a weather warning
May 2008	Heavy rainfall resulting in flooding	Clarendon Road, Southsea flooded (30mm in 12 hours) and the Strand area of Southsea; Old London Road flooded.
July 2008	Heavy rainfall resulting in flooding	
January 2009	Cold temperatures, ice resulting in health impacts	Coldest since 1979; -7c; Canoe Lake frozen over.
February 2009	Snow resulting in disruption to services	One inch of snow overnight.
November 2009	High winds resulting in damage to property	70 m.p.h winds. Two gables in Balfour Road and Green Lane collapsed.
December 2009	Snow and ice resulting in service disruption	
January 2010	Snow resulting in service delivery failure	Two inches of snow overnight and 2 more inches in the morning. Canoe Lake frozen over.
July 2010	High temperatures resulting in health impacts	
August 2010	Heavy rainfall resulting in flooding	Copnor Road, Clarendon Road flooded. Seven properties damaged by sewerage.
November 2010	Heavy rainfall resulting in flooding	Fratton Park, Eastney swimming pool, Lake Road, Fratton Road flooded
December 2010	Snow and ice resulting in service disruption	Schools closed, Delayed rubbish collections, Transport problems - trains, buses, ferries, Day centres closed
April 2011	High temperatures resulting in health impacts	
December 2011	Heavy rainfall, storms and gales, resulting in flooding	Damage to buildings from e.g. Fallen trees, Flooding on roads, Damage to telegraph poles, Ferries cancelled
January 2012	Gale force winds resulting in damage to property	Uprooted trees; collapsed roofs; damaged signs. Damage at Court Lane Infant School, Cliffdale Primary, Wimborne Infants. Leaking

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		water through buildings - Eastney Community Centre; Carnegie Library; Edinburgh House; Meon Infant/Junior School; Longdean Lodge; Redwood Park; Stamshaw Junior; Merefield House; Civic Offices; Flying Bull; College Park Infants;
March 2012	High temperatures resulting in health impacts	
April 2012	Heavy rainfall and gale force winds resulting in flooding and damage to property	Scaffolding on side of Royal Beach Hotel collapsed and crushed 6 cars. Road blocked
May 2012	High temperatures resulting in health impacts	
June 2012	Heavy rainfall and gale force winds, resulting in damage to property	Portsdown Primary School closed - children evacuated - after flooding. Flooded roads in Purbrook
July 2012	Heavy rainfall, thunderstorms, resulting in flooding and damage to buildings	Houses flooded in Paulsgrove. Portsmouth recycling centre closed.

Appendix two – information from frontline services

Service	Impacts on Service	Response to past events	Preparing for future events
Clean City Services	Flooding in 2000		
	<p>Need to make sure enough resource is left to manage regular services and ensure staff are realistic in their expectations</p> <p>Waste management was a key issue – assessment needs to be done by waste team - skips filled up quickly with furniture and misused by builders. Collection points for rubbish might have been more efficient.</p> <p>Land ownership was a problem e.g. cleaning private gulleys</p>	<p>Looking at event – what resource is available, what needs to be prioritised and where could we redeploy resource? Recovery plan formed where necessary.</p> <p>Provided skips for furniture to be put into by residents and vehicles.</p>	
	Heatwaves		
	<p>Dogs left in cars and heat exhaustion - need to have RSPCA to assist in problem</p> <p>Staff welfare e.g. sunburn</p> <p>Water shortages can lead to lack of water in toilets</p> <p>Dumped waste is worse in summer - increased risk of arson/fires</p> <p>Rubbish/dog bins smell more during heat waves</p>	<p>Train people in noticing signs of heat exhaustion and provide water and sun cream to outside staff</p> <p>Raise awareness of jelly-fish potential problems</p> <p>Different colour bin bags for dog bins used – public perception improved</p>	<p>Record-keeping from incidents – what resources were needed and used</p> <p>Understand financial impact</p> <p>Working in partnership with other groups e.g. environmental health, the police, community wardens</p> <p>Devising Recovery Plans</p>
Waste	<p>No flooding of collection depot Knock-on effects on rest of system (waste build up at waste facilities)</p> <p>Heatwaves - Copnor facilities reliant on ready supply of water – could potentially affect the operation if there was a drought</p>	<p>Skips on street for waste provided by emergency planning team</p>	
Tourism	<p>Bandstand events cancelled due to bad weather, although events generally not impacted any more so than ordinarily.</p> <p>Flood damage to VICs – carpet replaced, £1000 in total</p>	<p>Close front door and put sandbags out, and provide access via back doors</p>	
Adult social care	<p>Winter pressures found across all services, not just impact on staff, e.g. increase referral rates, increase hospital admissions – their job is to get people out of hospitals. Snow was also a problem - had to close day centres.</p>	<p>Have a major incident support team; although they tend to just cope with what happens/comes up.</p> <p>Working with providers to encourage them</p>	<p>Contingency plans for all services & events e.g. where most vulnerable people are. Those most</p>

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	<p>Service pressures heightened during heatwaves and controlling temperatures is a challenge.</p> <p>All impacts such as closures need to be assessed and appropriate action taken. Smaller events are the most difficult to deal with, rather than the catastrophic events.</p> <p>Private care homes/sheltered housing – difficulty in knowing a) where they all are and b) what they do in an emergency</p>	to do Continuity Plans.	<p>vulnerable are at the top of the list.</p> <p>Big element of responses, planning & future is cost – adaptation isn't cost-effective, and so isn't implemented.</p>
Children's social care	Loss of staff/facilities is biggest impact, but also a cumulative impact – work not done needs to be caught up with Fieldwork services: have to maintain basic child protection service	Squeeze children into another care home; buy alternative care from independent sector; cut down on site visits and let people go home earlier.	
Environmental health	<p>Greater strain on resources – working out of hours</p> <p>Problems in heatwaves: Increase in insurance right-offs from commercial freezer breakdown Pest-control could be a greater problem Noise complaints increase e.g. BBQs</p>	<p>Give advice: health risks, street cleaning.</p> <p>Site visits: food premises visited, visual checks – rats, noise from pumping station, seawater samples, daily checks made at pumping station – fencing, signage, potential leaks, new noise issues, inspection of flooded property</p> <p>Regular site visits pushed back and team deployed overnight in emergencies</p>	<p>Logging of events – what was done, dates etc...</p> <p>Work on an ad-hoc basis for emergencies</p>
Education	<p>Although many schools in flood risk areas, current situation is very few schools are affected by flooding – not a major issue</p> <p>Heat-waves can be a much greater problem. Poor building control and ventilation affects inner city schools much more than schools to the north. ICT suites & inefficient air-con systems – not built in but industrial units.</p>	<p>Response is usually reactive - flooding often occurs through night, so early morning calls flooding is found.</p> <p>Assess situation – use common sense – react appropriately – usually closing school</p>	<p>Ken & others are on 24/7 callout to schools should there be any problems</p> <p>Schools complete their own BC plan</p>
Public Transport	Ferries, hovercraft and buses all affected by severe weather – services cancelled. Also problems with blocked transport routes, leading to traffic	Communication – phones continually manned throughout our operating period	

Appendix two – information from frontline services

	congestions.	<p>(0530 -2400hrs, 364days a year). We will also advise local radio stations and post a pop-up on our website. Sometimes temps can be taken on to cope with influx of calls (First Bus).</p> <p>Some services cancelled to reduce unsafe operation.</p>	
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