

Cumbria Local Climate Impacts Profile



Carlisle Floods 2005

A portrait of the impacts of extreme weather events on local services, communities, economy and natural environment in Cumbria.

Developed by the Climate Change Task Group for the Cumbria Strategic Partnership

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Project background & Executive Summary

1. Project Background

The Cumbria Local Climate Impacts Profile (LCLIP) has been assembled to enable local authorities in Cumbria and the Cumbria Strategic Partnership (CSP) to better understand their exposure to extreme weather and climate change. The LCLIP represents only the starting point in a longer, more detailed process of evaluating the level of risk and opportunity that future climate change trends may bring. The study was commissioned by the CSP's Cumbria Climate Change Task Group (CCTG) and compiled during the Summer of 2010. To help partners consider future impacts of climate change, the project has examined the impacts of recent severe weather events in Cumbria focussing on the past twenty years, highlighting where these events have affected Local Authorities' (LA) assets and services, the local community, businesses and the natural environment.

The LCLIP seeks to help meet the objectives of National Indicator 188, the overall aim of which is to embed the management of climate risks and opportunities across all local authorities and partner services, strategic plans and estates and to take appropriate adaptive actions where required. The LCLIP aims are twofold;

- to underline where vulnerabilities might occur in the services of local authorities (LAs), strategic partners (CSPs) and the wider Cumbrian community;
- to raise awareness of the impacts of severe weather and climate change in Cumbria, thereby helping to promote an evidence based response.

The LCLIP concludes by making generic recommendations that aim to enhance LA and CSPs resilience to extreme weather events and that are particularly relevant to Cumbria County Council, the six district authorities and the Lake District National Park. It is proposed that this broad level assessment is then used by LAs and CSPs to produce more refined and tailored LCLIPs specific to their own areas and services, informing their own risk assessments and adaptation strategies.

1.1 Methodology

This report draws its weather and climate change information from the records of the Cumbria Weather Forum, from the Environment Agency and from UKCP09 (UK Climate Projections 2009), respectively. A review of media reports on recent extreme weather events between 1996 and 2009 provided an indication of responses to the impacts of some of these events by local authorities, communities and members of the public. Discussions with several of Cumbria's emergency services and Resilience Unit have further supported the process of evaluation. However, the study stopped short of interviewing senior departmental managers within LAs and CSPs as this was considered a task for each organisation to undertake during the development of their own LCLIPs.

1.2 General findings – Impacts of Recent Extreme Weather Events

Using data supplied by the Cumbria Weather Forum and Environment Agency, the LCLIP found that Cumbria has been affected by at least 93 recorded significant weather events in the past 60 years. More recent media reports show that these events are associated with varying levels of severity and impacts for LAs, communities and the environment. Heavy rainfall and severe flooding are the most frequent events to impact Cumbria, closely followed by windstorms and snow. Many communities have experienced repeat incidences of flooding, such as Carlisle, Keswick and Cockermouth. It has been all too evident in the major floods of recent years that affected communities have suffered substantial psychological and economic trauma; those that are repeatedly flooded often complain both to and about organisations they see responsible for either failing to prevent the flood in the first instance or failing to cope adequately with the aftermath.

The very dry summers of 1992, 1995, 2003 and 2010 have all seen disruptions and hosepipe bans due to drought conditions, whilst even as recently as 2006 Cumbria experienced temperatures as high as 34°C in Whitehaven, with ambulance services receiving 152 heat related calls in just one day; road surfaces melted and increased incidences of blue green algal blooms were reported in Cumbria's lakes. Meanwhile, damaging winds in January 2002 killed 7 people, causing lorries to overturn, motorways and rail lines to close and costing millions of pounds to repair damage to property and buildings.

Severe weather can impact LA services in various ways. Fallen trees and debris frequently cause disruptions to the county's road network which not only affects direct road users but services that rely on transportation, such as primary care workers visiting vulnerable clients or the thousands of LA workers that travel to schools and offices everyday. Unexpected extremes of weather, such as periods of hot weather and windstorms, can lead to unforeseen costs for LAs and budgets can become stretched as well as leading to burgeoning workloads, delayed programmes of work and increased pressures on staff.

The floods of November 2009 exemplify the scale of climate change impacts when over 500 Environment Agency staff became involved in the response to the Cumbrian floods, fielding 22,000 calls from the public. A number of bridges across West Cumbria were damaged or collapsed (one with a tragic loss of life), with several bridges remaining closed for months, resulting in huge additional travelling distances (in Workington, a 10 minute, 1 mile journey to get to work became a 2-3 hour, 20 mile journey).

The floods put additional pressures on social services, housing, economic regeneration, waste and trading standards. For example, Impact Housing Association reported 78 properties badly damaged by the floods, of which 38 had to be evacuated, with repairs costing around £1.4m. Annual premiums increased from £280,000 pa to nearly £500,000 pa, with some tenants unable to obtain contents insurance. The effects of such extreme events often last far longer than the event itself - it took nearly 5 months to complete the final reinstatement works to Impact's damaged homes, although many tenants moved back in very quickly. The tenants who were out longest were in properties where there was structural damage (for example, to lifts and lift shafts) or where sewage contamination required extensive drying, disinfecting and reinstatement. Flood defence works are scheduled to start in Keswick in 2011 if funding is secured and would not normally be completed until the following year. Investigations

are ongoing in Cockermouth and Workington to identify ways to reduce flood risk but there is no guarantee of major flood defence schemes. The estimated cost to insurers of the 2009 flooding for Cumbria and South West Scotland has been estimated at over £100 million, with United Utilities incurring £450,000 alone in repairs to flood damaged water pipes in Cumbria.

Meanwhile, responses to a survey by Cumbria Tourism at the time showed 72% of tourism businesses had been affected by the flooding, some directly by water damage, but others as a consequence of cancellations precipitated by adverse national media coverage which, amongst other sensationalism, questioned the safety of all of Cumbria's 1800 bridges. Cumbria Tourism attempted to counter this negative publicity with over £450,000 worth of print and radio coverage, a sum that needs to be taken in the context of an estimated £15.4million loss to the tourism economy and a further £7.9million incurred through damage to infrastructure within the National Park (see Appendix 4). With these figures representing only some of the financial records, and not those of the LAs, the total cost of severe weather on property and services would be considerably more.

Alongside the unexpected impacts, weather events also have similar repetitive impacts on LA assets and services, such as road networks and building maintenance. These repetitive impacts have a dual cost in terms of resources and labour hours that largely go unaccounted for, as they are a part of routine work. Such impacts will likely be exacerbated by predicted increases in the intensity and frequency of extreme weather events and other climatic changes; these are commonly not formally considered.

1.3 Positive Impacts

Records of the positive impacts of climate change events are much harder to find, especially in the context of this report which focuses on extreme events which by their very nature assume a level of disruption. This does not mean that positive impacts do not currently occur or won't have greater influence in years to come. The impacts of periods of warm, dry settled summer weather may well be attracting greater visitor numbers to Cumbria already as well as improving crop yields, for example, but disaggregating these increases from factors such as foreign currency exchange rates or more accurate use of fertilisers is extremely difficult. In the future, the Cumbrian tourism industry might well benefit both from the displacement of tourists away from traditional Mediterranean resorts (which themselves increasingly face extreme, disruptive summer temperatures) and also from improvements in Cumbria's own summer weather.

1.4 Recent and future weather trends

Recent trends for the North West of England indicate that there has been a general move towards drier summers and wetter winters and that annual mean temperatures have significantly increased since 1961 with 2006 being the warmest year since records began. The experiences of the extreme flooding in Cumbria in November 2009 followed by the drought conditions and hose pipe bans of July 2010 is indicative of this trend (though clearly the examination of a single year 2009/2010 is not sufficient to claim statistical validity for longer term trends).

This move towards wetter winters and drier summers is, however, unlikely to manifest itself uniformly across Cumbria due to the county's diverse topography, influenced by a predominantly maritime weather pattern and leading to variations in local micro climates responses. With a significant proportion of the county characterised by steep sided, upland fells flanked by flat plains (much of which are represented by extensive coastline) Cumbria is particularly vulnerable to extreme weather events. For example, high rainfall in Cumbria's uplands has led to a number of downstream flooding events in recent years with devastating results for local communities, in particular, Carlisle. This topographical diversity also makes it additionally difficult to predict with confidence the very locally specific impacts of climate change.

Nevertheless, there is a strong scientific base of evidence that suggests Cumbria will experience changes to its climate over the course of this century, including sea level rise, increased heat waves, drier summers and increased frequency and intensity of extreme weather events, such as intense rainfall and windstorms (UKCP09). The UK public and Government are demanding that more be done to address climate change issues and the Climate Change Act (2008) and other key legislation seeks to translate this demand into action.

Even in the short term, climate change predictions for the Northwest indicate temperature and rainfall variations which, whilst on face value appear to show minimal change, are in fact significant and already being associated with increasingly unseasonal and extreme weather events.

Table 1: Source: UKCP09

| 2020's | <i>Emissions scenario</i> These predictions are realistic, as they relate to emissions that have already been released. | | |
|-----------------------------|---|------------------------|------------------------|
| | <i>Low</i> | <i>Medium</i> | <i>High</i> |
| Winter Mean Temp. | 1.2 °C (0.4 to 2 °C) | 1.2 °C (0.5 to 2 °C) | 1.2 °C (0.3 to 2 °C) |
| Summer Mean Temp | 1.6 °C (0.8 to 2.5 °C) | 1.5 °C (0.6 to 2.5 °C) | 1.5 °C (0.6 to 2.5 °C) |
| Summer Mean Daily Max Temp | 2 °C (0.6 to 3.5 °C) | 1.9 °C (0.4 to 3.5 °C) | 1.8 °C (0.5 to 3.3 °C) |
| Summer Mean Daily Min. Temp | 1.5 °C (0.6 to 2.6 °C) | 1.5 °C (0.5 to 2.6 °C) | 1.4 °C (0.5 to 2.5 °C) |
| Annual mean precipitation | 1% (-3 to 7%) | 0% (-4 to 6%) | 0% (-4 to 6%) |
| Winter Mean precipitation | 4% (-3 to 14%) | 6% (-1 to 14%) | 4% (-3 to 13%) |
| Summer mean precipitation | -5% (-19 to 9%) | -7% (-22 to 9%) | -4% (-18 to 10%) |

1.5 Key findings – Organisational response and exposure

Using media sources and drawing from information gathered from Cumbria Weather Forum, partners on the Climate Change Task Group, the emergency services and Resilience Unit this project has highlighted a number of significant areas where LA assets and services and the wider Cumbrian community are affected by weather. Significant findings include:

- **LAs and CSP organisation are vulnerable to large-scale and/or unexpected weather events.**
- **Weather events are generally responded to rather than planned for.** Extreme weather events are also largely seen as the responsibility of Emergency Planning. There are indications that limited consideration has been given by LA departments, the CSP, organisations and businesses as to how severe weather might impact on their service delivery in the future, though some have included aspects of weather impacts in their Business Continuity Plans. Although there are examples of good Emergency Planning, steps also need to be taken to mitigate impacts of weather through long-term planning. With severe weather predicted to increase in the future, forward planning may provide a more stable basis in which to handle the effects of severe weather within the LAs.
- **Many local authority departments have either scant records of the impacts of weather on their services** or no record systems at all. Knowledge of past weather events, in terms of impacts and consequences to council services, local communities, businesses and the environment, is more often than not informal (e.g. stored in individual's memories or journalistic sources) rather than systematically recorded and maintained. In addition, due to modern working patterns people tend not to stay in the same job as they might have done in the past. More needs to be done to counter the loss of institutional memory due to quicker staff turnovers. More accurate recording of weather events and their impacts and consequences could help counteract this
- **Weather events impact on LAs' reputations**, with poorly handled events often receiving negative press and well-handled situations often going unnoticed. Nevertheless, the responses of the emergency services and voluntary sector to the November 2009 floods was generally reported in a very positive light, whilst at the same time unfounded rumours abounded about the Environment Agency and United Utilities' role in failing to contain the flood. The local and national press has enormous power in influencing the public's perception and response to extreme weather events, potentially exacerbating the economic and social impacts.
- **Inadequate drainage is a big problem and is expensive**, time consuming to deal with and has an adverse affect of council reputation. Surface water flooding incidents are relatively common and increasing, further exacerbated by weather related factors.

- **There is a growing body of experience and expertise in Cumbria** in dealing with the impacts of extreme events, in planning, in operations and in dealing with the press; this presents an opportunity for sharing this wealth of expertise across service delivery partners and other institutions. Various departments within Cumbria County Council (including the Constabulary, Fire and Rescue and Highways) as well as within the NHS / PCT have developed risk registers and contingency plans and these will provide useful guidance to other service providers in assessing risk and building a response.
- **There is generally a heavy reliance on ‘good will’ service** when departments deal with the impacts of extreme weather events. More frequent and intense weather events may increase pressures and challenge such informal arrangements. Additionally, new EU legislation over break times and increasing concerns for staff health & safety might require greater forward planning. Introducing more formal procedures which detail how individuals/delivery partners can be released from their usual duty to be reassigned – for duties such as door knocking/filling sandbags – could help to overcome potential tensions.

1.6 Recommendations

Based on these findings the report proposes the following recommendations for LA’s and CSP members in their approach to developing comprehensive adaptation strategies:

- **The Climate Change Task Group should present this report to the CSP Environment Thematic Partnership.**

The Task Group recommends that the Partnership use this report as a platform for increasing awareness and action on adaptation in Cumbria.

- **CSP member organisations need to undertake individual climate change risk assessments for their own buildings, staff, resources and services.**

In line with objectives defined by NI 188, requirements under the Climate Change Act and also commitments given to delivering the Cumbria Climate Change Action Plan, all LA and CSP organisations need to complete their own individual risk assessments of the potential severity and frequency of the impacts of climate change, identifying the vulnerabilities and opportunities to their services (public health, transport, tourism, agriculture, economy etc.) The findings of these risk assessments should lead to detailed action plans which should be shared corporately across departments and also be included in project risk registers.

- **Agree a means to share information on climate change risk impacts and management strategies.**

The CSP Environment Thematic Partnership needs to consider how best to gather and share information which records the impacts and costs of climate change in Cumbria, maintaining a register of risk assessments and management strategies. This central database would enable the development of an overall, strategic assessment of risk across Cumbria. This role might be undertaken either by Cumbria County Council or through the CSP. It would also inevitably help individual organisations which had yet to develop their own responses to climate change by providing real case studies and a template for risk assessment. The CSP website might offer a possible ‘home’ for this

information, whilst an initial workshop on adaptation facilitated by the Cumbria Climate Change Task Group is also recommended.

- **Building local resilience by engaging communities**

Increasing community-based resilience to weather is an important adaptation measure for Cumbria, particularly for communities at risk to flooding and is also recommended by the Pitt Review (2007). Work being done on this by Emergency Planning and the Resilience Unit will help to raise the profile of this both within and outside the LAs.

- **Increase understanding of surface water flooding**

Producing GIS maps of surface water flooding will increase understanding of which communities are vulnerable and help inform long term planning decisions. (The Environment Agency has produced indicative surface water flooding maps and shared these with Local Planning Authorities to help them with their LDF preparations. However, they are not yet sufficiently refined to inform individual planning application decisions and are not therefore widely publicised.)

- **Develop IT capacity to enable staff to work remotely from home**

Developing technical capacity to enable staff to work remotely from home will help to minimise service disruption occurring from staff difficulty getting to work. At least in the first instance section managers should identify which members of staff might be able to work from home from their own PCs in the event of an emergency. Cumbria is generally poorer than the rest of the UK for connectivity and this will continue to constitute unnecessary disruption when extreme events cause travel difficulty.

- **Formalise 'good will' working agreements and train more staff**

Training LA workers from other departments or service areas that are not so directly affected by weather events so that they can respond in an emergency situation would result in better deployment of staff in an emergency situation. The contribution of personnel from many different Cumbria County Council departments during the floods of November 2009 and the aftermath demonstrates the benefits of cross sectoral training and participation. In addition more formal agreements that detail how individuals/delivery partners can be released from their usual duty to be reassigned – for duties such as door knocking/filling sandbags – are recommended.

- **The role of spatial planning needs to be investigated**

With severe weather predicted to increase in the future, long term strategic planning may provide a more stable basis in which to handle the effects of severe weather within the LAs. New developments and building design could play a key role in this, such as use of sustainable drainage systems. Additionally, traditional ways of making decisions may need to become more creative and flexible; for example, adjustments to existing transport networks may be necessary.

1.7 Conclusion

The LCLIP project provides evidence demonstrating that the all LAs, CSP delivery partners, and communities are impacted when severe weather events strike Cumbria, though not uniformly nor predictably. Research shows that whilst some Cumbrian organisations have developed contingency plans for responding to the impacts of extreme weather in the aftermath of an extreme event, most organisations fall short of having developed corporate strategies for minimising the risks of adverse impacts from climate change or maximising the opportunities; fewer still have invested in adaptation measures. In spite of this shortfall, the flood protection measures installed after the Carlisle floods of 2005 suggest that successful preventative measures can pay dividends, even in the short term (in this case, as early as November 2009 when the new £38million defences installed by the Environment Agency prevented flooding in parts of Carlisle).

A process of engaging with policy makers, senior managers, staff and community representatives across the Cumbria Strategic Partnership members is now urgently required. This LCLIP provides a starting point for this awareness raising and planning. Comprehensive risk assessments need to be carried out by each LA, CSP organisations and lead agencies for each sector in Cumbria. These need to identify the vulnerabilities and opportunities for services, developing detailed action plans and embedding those actions corporately, including sharing these with key delivery partners and local communities. It is recommended that these risk assessments and action plans be gathered centrally and shared on the CSP website and through a pan Cumbria event, enabling best practice to be identified and serving to accelerate and co-ordinate the Cumbria response.



Figure 1.Haweswater – Drought Conditions 1995 (Courtesy of United Utilities plc)