

There is no doubt that Cumbria's climate is changing. Evidence shows that our summers are becoming warmer and dryer and winters are wetter. Extreme weather events are more frequent.

Despite some contrary 'blips', data shows that these trends will continue and that heat waves, droughts and floods will occur more often.

People can feel powerless in the face of such changes. However, there is much that can be done to minimise the adverse effects and adapt to Cumbria's changing climate. Most importantly, individuals and communities can take simple actions that make a difference.

Introduction

This paper aims to help by:

- Summarising the trends in climate change, where possible with particular reference to Cumbria
- Reviewing the types of extreme weather events that have been experienced in the County in recent years and that are likely to become more frequent.
- Outlining the actions that can be taken by individuals and communities to adapt to their changing environment and improve their resilience, that is their ability to manage and bounce back from the adverse impacts of extreme weather events.

The Evidence

In March 2014 the Met Office Hadley Centre published a paper 'Too hot, too cold, too wet, too dry – Drivers and impacts of seasonal weather in the UK'¹

The paper concludes that "when viewed over long-term averages, the UK is expected to see more milder, wetter winters and more hotter drier summers in the future."

"But the UK has seasonal weather that also varies hugely from year to year due to natural processes. New analysis suggests that we should also plan to be resilient to wet summers and to cold winters through this century."

Highlighted conclusions in the paper include:

Climate change has at least doubled the risk of a heat wave exceeding the temperatures in the European heat wave of 2003

UK summer temperatures have warmed by 0.28°C per decade since 1960. The summer of 2003 was the hottest for 500 years across parts of Europe. In July 2003 the UK recorded its highest ever temperature of 38.5°C and there were runs of days where the maximum temperature consistently exceeded 32°C.

Cumbria's climate trends

- Daily temperatures rising by 1 - 2°C by 2050.
- Summer rainfall reducing by up to 15% by the 2020's.
- Winter rainfall rising by up to 15% by 2050, rising further by 2080.
- More frequent incidence of very heavy rain leading to flooding and flash flooding.
- Snowfall reducing by 10% by the 2020's, and up to 55% by the 2050's.
- More extreme weather patterns with heat waves that are now only occasional becoming the norm.

However, in the short term Cumbria may experience wetter summers and colder, snowier winters.

The UKCP09 climate projections² suggest the UK's mean annual temperature will rise by up to 3.5°C in the south and 2.8°C in Scotland by the 2080s compared with the 1961-1990 average.

New analysis suggests we should plan to be resilient to very cold winters, such as 2010/11

Winters in the UK have become warmer, at a rate of 0.23°C per decade since 1960 and the number of days with air frost has fallen by up to 50 days in North West England. Climate projections suggest that these trends will continue with UK average winter temperatures rising by between 2°C and 3°C by 2080.

Despite these trends, 2010 saw the coldest December for 100 years. There is mounting evidence to suggest that the rapid melting of the Arctic sea ice (itself a consequence of climate change) may, in the short term, result in colder snowier winters for North West England, and possibly wetter summers, as cold moist air from the Arctic moves south.

There is evidence to suggest that the character of UK rainfall has changed, with days of very heavy rain becoming more frequent. What in the 1960s and 1970s might have been a 1 in 125 day event is now more likely a 1 in 85 day event.

UK records show very large variations in rainfall, making trends hard to detect. However, it does appear that the character of precipitation has changed with heavy rainfall events becoming more frequent in both summer and winter.

In the last seven years, five summers saw higher than average rainfall (2007, 2008, 2009, 2011, 2012). There have also been exceptionally wet winter periods including, in Cumbria, the winters of 2005, 2010 and 2013.

UKCP09 projections suggest that, in general, winters will become wetter as a consequence of the greater moisture carrying capacity of a warmer winter atmosphere. Projections also suggest that summers will become drier. However, there will continue to be variations within these broad trends that will include both dry winters and wet summers.

While connections can be made between climate change and dry seasons in some parts of the world, there is currently no clear evidence of such a link to recent dry periods in the UK, such as in 2006 and 2010-2012.

Impacts

Exceptional periods of **heavy rainfall** cause both flooding and flash flooding. In 2014 the UK Committee on Climate Change advised that *'Increased flood risk is the greatest threat to the UK from climate change'*⁴ with a doubling – to 550,000 – in the number of homes at significant risk of flooding by 2035.

The Environment Agency's 'Rapid Response Catchment North List' identifies 67 localities in Cumbria that are flood risk areas. There are over 9,700 properties in these areas.

High temperatures result in increased mortality. Exceptional temperatures during the first two weeks of August 2003 led to 2,091 excess deaths, mainly among those aged over 75.

In 2010, **freezing conditions** caused widespread disruption to travel, transport and other services across the UK.

Droughts both in the UK and abroad impact on Cumbrian residents, seeing hosepipe bans, increased incidence of forest and moorland fires and rising prices for food and other commodities. For example, the severe 2011 drought in Texas resulted in increased prices for animal feed, beef and cotton, reflected in a 42 point rise in the global food price index.

Extreme Weather in Cumbria

Records of extreme weather events affecting Cumbria go back over many centuries. However, the following brief summary, based on examples since 2000, illustrates their frequency and diversity.

Flooding has affected every part of Cumbria with particularly notable events in September 2000, February 2002, July 2002, August 2004, January 2005 (the Carlisle floods, the worst for 140 years), December 2006, November 2009 and June 2012.

These flood events in Cumbria have resulted in loss of life, the flooding of large numbers of homes and businesses and damage to infrastructure including roads, bridges and railway lines.

Extreme Weather in Cumbria (Cont.)

Severe **gales** in January 2002 and January 2005 caused loss of life, damage to buildings and the closure of the M6 and West Coast Main railway line.

Heavy **snow** and blizzards in February 2002, December 2003, February 2005 (the worst for 20 years), March 2006 and March 2013 disrupted travel in north, east and west Cumbria, the central Lakes and the North Pennines. The same events have also caused power cuts.

A **heat wave** in July 2006 saw temperatures of 31°C in Cumbria (2006 was the warmest year ever recorded in England).

January 2010 saw an exceptionally long **cold** spell with temperatures below 0°C for long periods accompanied by heavy snow. 2010 also saw the least rainfall recorded for the period January – July since 1929, leading to **drought** conditions across much of Cumbria.

Climate change is driving an increase in the frequency of extreme weather events of the types that have been described.

Individual & Community Responses

There are many actions that can be taken both individually and at community level to reduce the carbon emissions that are driving climate change, and to ensure effective preparation for future extreme weather events.

The first simple, but most important, action is to think about and discuss the issue, as it may affect either your particular household or the local community.

Actions to adapt to climate change and increase resilience in the face of extreme weather events broadly fall into two categories:

- Resource Efficiency
- Forward Planning

In planning actions, special thought needs to be given to those who are most vulnerable such as older people, young children, and those with limited mobility. They may need help in implementing adaptation measures in their homes and in coping during an emergency.

Plan ahead, think about:

- How extreme weather may affect your home and your community.
- Ways of making your home more energy efficient.
- Ways of making your home and community less susceptible to damage during heavy rain, snow or flooding.
- The steps you may need to take if extreme weather occurs.
- People who may need your help.

Resource Efficiency

Individual households are able to adopt many measures, some at no or low cost. Simple steps such as draught proofing and improving insulation help to cut carbon emissions while at the same time helping to reduce household costs such as energy bills.

For some, the installation of more efficient household appliances and heating systems will represent a worthwhile longer term investment especially if there are opportunities to harness renewable sources of energy such as ground source heat pumps, solar energy or bio-mass.

Community groups can be proactive in encouraging local residents to adopt appropriate household measures and may also be in a position to demonstrate good practice through community composting and recycling schemes.

Groups can also use the opportunity of renovating a village hall or other community building to show the benefits of good insulation, efficient heating and renewable energy generation systems. They can even generate energy for the whole community with community owned hydro, solar, wind or biomass schemes.

These household and community actions are all win-wins, they save money, reduce the use of resources and help to mitigate the impacts of climate change.

Forward Planning

Emergency planning may sound like something that is the responsibility of local authorities. However, when extreme weather events occur that have widespread impacts it is inevitably the case that public sector resources become very stretched.

It is important, therefore, that individual households and communities plan ahead and think about how to manage when flooding or another extreme event occurs.

Forward planning can take many forms. To make a start, simply think about the vulnerability of your own household to flooding, heat, or another extreme event, and consider how you will manage in such circumstances:

- Is there an elderly member of your own household, or a neighbour, who might need support in the event of a flood or heat wave?
- What help might they need?
- What will you do if floods or snow affect your access to key facilities such as schools, shops, work or medical services?
- If it is at risk, are there practical measures that you can take to flood proof your home to minimise possible damage?

In your community you may benefit from working with neighbours and local organisations, such as the parish council, to prepare a **Community Emergency Plan**. This needn't be complex and can be especially useful if you have experienced extreme events, such as flooding, which may occur more frequently in the future. Working together:

1. Consider the types of extreme weather events that may affect your particular community.
2. Discuss what can be done locally to manage and minimise the impact of such events (flood management, maintaining communications, keeping people safe).
3. Identify those people and properties that are particularly vulnerable.
4. Consider how the wider community could help to support those people and properties.

5. Identify the local resources that you will have available to you in an emergency that might be useful.
6. Record your conclusions and share these with the wider community.

Further Information

ACT can provide practical advice and support in developing a Community Emergency Plan for your area. Guidance materials, including a 10 step Toolkit, and video case study can be found on the ACT website: www.cumbriaaction.org.uk/WhatWeDo/CommunityEmergencyPlanning

For more information about Community Emergency Planning contact Hellen Aitken at ACT on Tel: 01228 817592 or Email: hellenaitken@cumbriaaction.org.uk

Advice on sustainable living, including energy efficiency and renewable energy, is available from Cumbria Action for Sustainability (CAfS). Tel: 01768 210276 or visit their website: www.cafs.org.uk

References

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5. Community Climate Change Adaptation – Dr Terry McCormick and Gwen Harrison for Lake District National Park and ACTion with Communities in Cumbria, April 2013.

For more information please contact ACTion with Communities in Cumbria on Tel: 01228 817224 or visit our website: www.cumbriaaction.org.uk

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