

Floods, climate change and flood defence investment

8th December 2015

This short briefing has been put together following the recent floods affecting Cumbria and Scotland in December 2015.

1) Are the recent floods linked to climate change?

The Paris climate talks are in full swing. And over the weekend of 5th-6th December our increasingly erratic climate has shown its ability to impact even a rich country like the UK. 'Storm Desmond' has deposited very large quantities of rain over Scotland, northern England and north Wales, causing widespread flooding – particularly in Cumbria.

The Met Office say that Honister Pass has set a UK rain record for any 24-hour period, of 341.4 mm.¹ Provisional data has a new 48 hour rain record at Thirlmere of at least 405mm – that's 16 inches.²

In Keswick, the £6m flood defences overtopped on 5th Dec, flooding the town centre and causing people to be evacuated. The defences had only just been installed in 2012³, following previous floods in 2009 and 2005 – showing that river levels have exceeded what was considered extreme even just three years ago. Environment Secretary Liz Truss said: "*There is a mark on the bridge in Carlisle showing the flood level in 1853. The 2005 flood was half a metre higher than 1853, which was the highest on record until then. This flood was half a metre higher again.*"⁴

We're a rainy island and storms can always cause occasional extremes of weather. But Met Office data clearly shows that annual rainfall has been increasing in the UK since the 1980s⁵. 5 out of the 6 wettest years in the UK have all been since the year 2000⁶. And two years ago, in December 2013-February 2014, the UK experienced its wettest winter ever recorded.

As the Met Office stated back then: "*There is no evidence to counter the basic premise that a warmer world will lead to more intense daily and hourly heavy rain events.*"⁷ It's basic physics that a warmer atmosphere can hold more moisture. This contributes to heavier downpours.

The UK's Committee on Climate Change said on Monday 7th December 2015 that "*The devastating flooding this weekend is a timely reminder that climate change is expected to increase the frequency and magnitude of severe flooding across the UK.*"⁸

It's hard to say individual extreme weather events are directly 'caused' by climate change, but this week the Met Office cited their research from November 2015 saying that when weather comes from the tropical west Atlantic, extreme rainfall is now seven times more likely than in a world without human emissions of greenhouse gases⁹.

It is not just in the UK where we are seeing increasingly severe and frequent flooding. The last month has seen devastating floods in Chennai and Tamil Nadu state in India, with over 270 people dying.

In conclusion, the latest devastating floods in Cumbria are consistent with what we would expect from a warming world – we are seeing impacts now, and the risks of more frequent and severe rainfall are increasing every year. To reduce these risks we must act in the UK and globally to cut our use of coal, oil and gas, and reduce greenhouse gas emissions.

2) Are we investing enough in flood defences and climate resilience?

In short, no.

The latest figures for UK government investment in flood defences came in Chancellor George Osborne's Spending Review of November 25th 2015. Defra's latest briefing on flood defence spending was published on 1st December 2015.¹⁰

The Chancellor announced that the Government was sticking with the £2.3bn *capital* spend for flood defences between 2015-2021 (the 6-year programme), as was announced back in Autumn Statement 2014.

But Defra still haven't stated what *maintenance* spending on flood defences will be for the next 5 years - in other words, what the Government will spend on repairing flood defences, not just building new ones.

In her statement to the Commons on 7th December, Liz Truss stated that “we are *protecting flood maintenance spending throughout this Parliament*”.¹¹ But neither she nor her department have announced actual budgets for flood defence maintenance beyond this current financial year, and therefore what amount of money is being ‘protected’.

Until they confirm levels of spend on flood defence maintenance, the Government cannot credibly claim that they are keeping pace with current flood risk. The Committee on Climate Change were clear after Autumn Statement 2014 that new funds for flood defence maintenance were sorely needed, stating¹²:

"Funding over the next six years will be higher than ever before but the extra funds, including from external contributions and efficiencies, are all on the capital side. Overall expenditure might “closely align” with the best long-term

path but that *doesn't mean that sufficient maintenance will be undertaken in the coming years to avoid assets deteriorating.*" [emphasis added]

Indeed, the Environment Agency's 2014 Long Term Investment Scenarios¹³ recommend 'optimum' overall investment (capital + maintenance) of £750m-£800m/yr. With capital investment averaging around £383m/yr (£2.3bn total) over 2015-21, the Government needs to be spending around £417m/year on maintenance, or £2.5bn over 2015-2021.

There is therefore a £2.5bn hole in current flood defence plans – even before we consider that we are facing higher levels of climate change.

3) Flood risk in a world beyond 2 degrees of global warming

All of this is modelled on the basis of 2 degrees of global warming. **These assumptions break down for global warming of beyond 2 degrees**, which is what actions currently pledged at the Paris climate talks put us beyond. Pledges to date, if met, will lead to around 3 degrees warming.¹⁴

The **Government have conceded that their flood modelling may be out of date** and not factor in the scale of climate change we are currently seeing. On Monday 7th Dec, the Guardian reported that **David Cameron raised this question himself in the morning's COBRA meeting**: *"Official forecasts may underestimate the risks of flooding, Downing Street suggested this morning. The prime minister's spokeswoman told journalists that David Cameron raised the issue at this morning's meeting of the Cobra emergency committee and asked whether there needs to be "adjustments" in relation to flood planning in the light of events over the weekend."*¹⁵ In Liz Truss' later statement to the House of Commons about the floods on Monday 6th December, she conceded: *"Climate change is factored into all the modelling work that the Environmental Agency does, but in the light of this extreme weather we must look at that modelling and ensure that it is fit for purpose for future decisions."*¹⁶

Friends of the Earth have also revealed **that the Government has been providing out-of-date advice** to planning authorities on the scale of climate change and flood risk that they should be preparing for. The latest official advice available on the Government website on 'climate change allowances for planners' from Sept 2013 reproduces old 2006 figures for river flood flows and rainfall levels.¹⁷ Yet Defra spent millions of pounds updating these figures in 2011 in light of the latest science, and to make their advice more detailed, accurate and regionally specific.¹⁸ But unaccountably, the latest Government advice directs planners to the old figures.

As an example of what this means, Defra's 2011 research concluded that for the North West of England, ie. Cumbria and Lancashire, planners should factor in an increase in river flood flows of 15-25%, and as much as a 40% increase under an 'H++' high-end climate change scenario. Yet the current official advice based on old figures assumes an increase of only 10% in river

flood flows across the whole country. **The Government must ensure planning authorities are given the latest advice on climate science in order to best prepare.**

Accepting higher levels of climate change and flood risk has serious implications for flood defence investment, too. Investing in line with what the Environment Agency's 2014 investment scenarios terms the 'high emissions climate change' pathway - ie. the pathway the world is following - would **cost an extra £300m between 2015-2021**. There is no indication from the Government that they are prepared to invest this additional money.

The CCC has also recently published research¹⁹ on how **hundreds of kilometres of our sea defences will begin to fail if global warming exceeds 2 degrees**, pushing sea level rise to levels where it undermines the foundations of many of our sea defences.

In their 2015 General Election manifesto,²⁰ the Liberal Democrats pledged to produce “a national resilience plan to help the UK economy, national infrastructure and natural resources adapt to the likely impacts of a 3-4 degree global average temperature rise.” This was the first time a UK political party had acknowledged the threat to Britain of global warming exceeding 2 degrees. In the wake of the Paris climate talks, **it's essential for the UK's national security that the Government produce a plan for how we cope with a temperature rise of 3-4 degrees.**

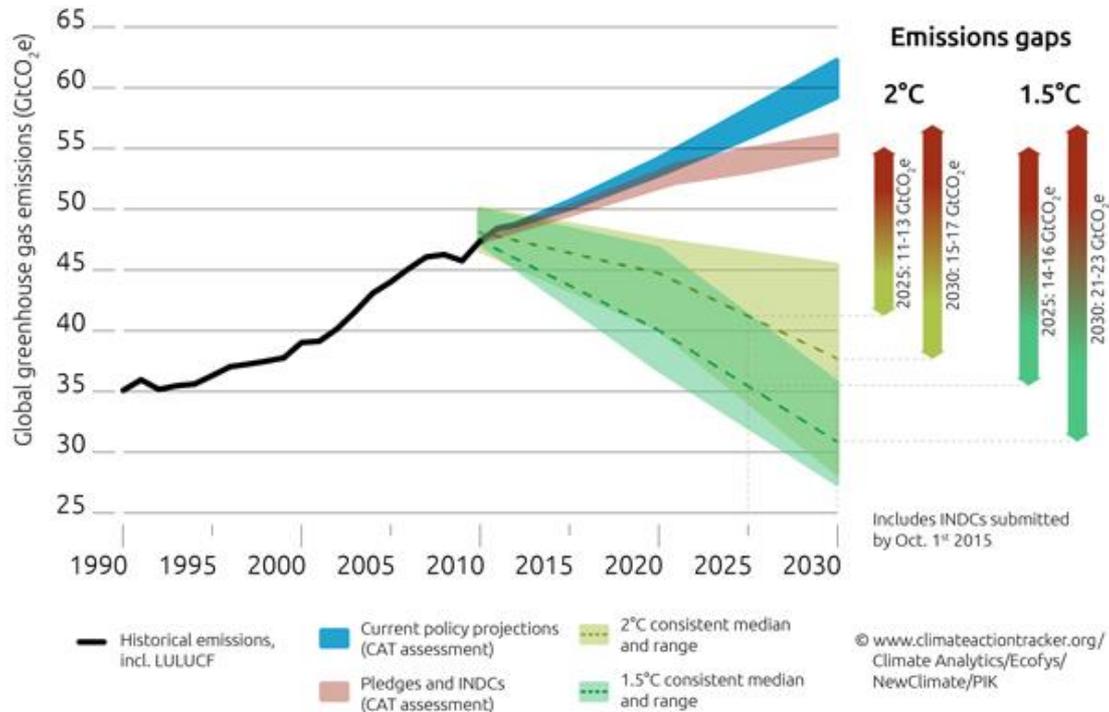
4) Are we doing enough to stop climate change getting worse?

Over 100 developing countries, and recently also Germany and France, have called for global warming to be kept below 1.5 degrees²¹. Other developed countries such as the UK and USA have a goal of keeping below 2 degrees. Right now, the pledges of all nations, if met, would lead to warming of around 3 degrees²². There is a very large “emissions gap” to get the world onto a safer 1.5 or 2 degree pathway, as show in the graph on the next page.

Countries like the UK have a historical responsibility to take a lead on tackling climate change, and have pledged to make a fair contribution.²³ Such a contribution would be at least an 80% cut in emissions by 2030.²⁴ Our current UK target is around 60% by 2030, but we are off-target to meet even that.²⁵ In addition recent months have seen major Government reversals on critical policies on energy efficiency and renewable energy, and the Government remains strongly wedded to extracting ever more oil, gas and reserves, when the science is clear that we cannot afford globally to burn more than 20% of proven existing oil, coal and gas reserves,²⁶ let alone go exploring for new fossil fuels.

To keep the risks of future flooding and other climate impacts manageable, countries like the UK need a far more urgent, comprehensive and stronger response to cutting carbon emissions.

Figure 1: How pledges at Paris still commit the world to over 2 degrees



5) Overall climate resilience and our capacity to respond

Lastly there is the question of the UK's wider capacity for climate resilience. Flood defence doesn't simply mean pouring concrete or building higher walls – at least it shouldn't if it's done right. It also means:

- **Sound planning**, to ensure we don't build properties in the floodplain in the first place. The National Planning Policy Framework is meant to ensure this – yet as studies by the CCC²⁷ and National Trust²⁸ show, planning authorities continue to allow thousands of homes to be built in flood plans and on coasts at high risk of erosion. The Environment Agency needs the power of complete veto over proposed developments in flood-risk areas.
- **Human capacity and resource.** Preparing for climate change requires central and local government to have the human resource to think through risks, and respond during emergencies. Yet Defra's climate adaptation team was cut from 38 staff to just 6 under the Coalition Government.²⁹ The Chancellor's latest cuts to Defra's budget³⁰ over the next five years are likely to further reduce the department's ability to properly prepare for climate change. It isn't just 'front line' Environment Agency staff who are required for climate

resilience – it's also 'back room' roles, such as planners, who are vital for preventing inappropriate development in the floodplain to start with.

- **Working with nature to fend off floods.** It's not only the climate that we've changed, but our natural landscapes. Many of our uplands are overgrazed and bereft of the vegetation that would slow the passage of rain off bare hills. Studies on Welsh hills³¹ have shown that reforestation just 5% of the land reduces flood peaks downstream by c.29%; introducing full woodland cover would reduce flood peaks by 50%. Yet agricultural subsidies still encourage the removal of trees and vegetation from the uplands. They need to be reformed.

Conclusions

Huge holes therefore remain in the Government's plans for flood defence, climate resilience and preventing climate change:

- 1) Will the Government **confirm the £2.5bn investment needed in flood defence maintenance between 2016-2021?** If it cannot, it should not pretend that its plans will keep pace with anticipated flood risk.
- 2) Will the Government **invest an extra £300m at least over the next 5 years to ensure flood defence measures keep pace with the EA's 'high emissions climate change' scenario?**
- 3) Will the Government **produce a National Resilience Plan showing how they will defend the UK from the impacts of global warming exceeding 2 degrees – given that this is what Paris commits us to?** In particular, how will they guarantee the integrity of sea defences as rising seas undermine their foundations?
- 4) **Will the Government improve our country's overall capacity for climate resilience,** by giving the Environment Agency powers to stop new developments in floodplains; stopping cuts to vital human resource at Defra and the Environment Agency; and reforming agricultural subsidies that reduce nature's ability to slow floods?
- 5) **Will the Government put in place a comprehensive strategy to ensure the UK makes a fair global contribution to keeping global warming to 1.5 degrees?** This is essential to protect the people of Cumbria, Chennai and people all over the world from the ever-increasing risks of climate disasters.

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References

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- ² The previous 09-09 GMT record covering two consecutive rain-days – i.e. 48 hours – was 395.6mm on 18 and 19 November 2009 at Seathwaite, Cumbria
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