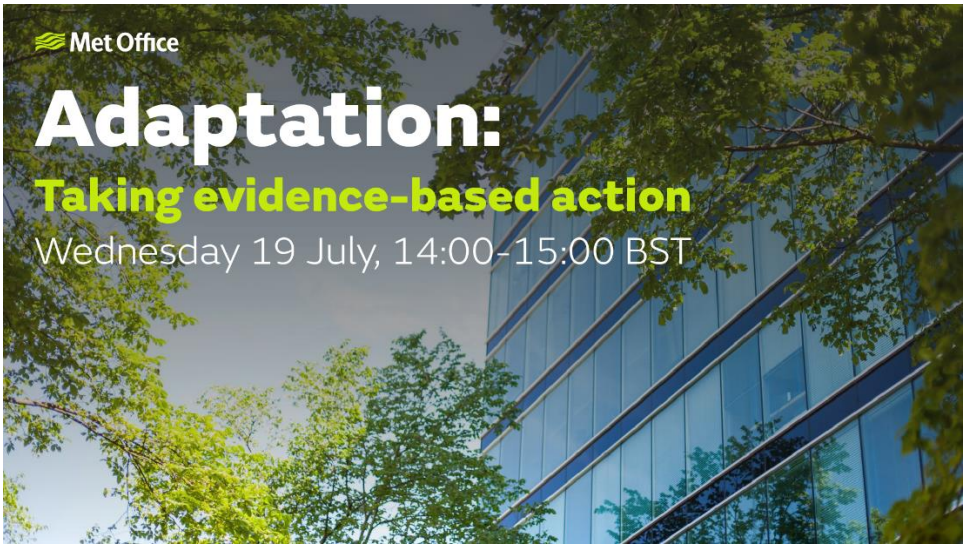



## Background

The earth has already warmed by approximately 1.1 °C compared to pre-industrial times, and we are already seeing impacts from this in all parts of the world. Even if all emissions stopped today, we cannot avoid further impacts. For example, sea level rise takes many years to respond to increasing global temperatures and we will therefore see our seas rise for many years to come.

Adaptation is therefore critical for our resilience to climate change. In this webinar, we explored the importance of taking an evidence-based approach to adaptation, considering the current level of implementation in the UK as well as the latest UK Government vision for adaptation. We also heard about examples of adaptation in practice.

We were joined by speakers from Marsh McLennan/Grantham Research Institute/Climate Change Committee, Defra, Clinton Devon Estates and JBA Consulting.

## Key webinar talking points

### The motivation for action on adaptation

Climate risks are already happening with ongoing impacts. We all remember the 40 °C heat that we experienced in the UK last year as well as various episodes of wildfires and extremely heavy rainfall in recent years. We are currently seeing heatwaves in the US, Europe and parts of Asia, further bringing home the need to build resilience and adapt. These types of extreme event are not something that is way off into the future and they are expected to increase further as a result of climate change. As a global community we are committed to further warming and impacts, even if we were to reach Net Zero globally tomorrow. We have failed to reduce emissions quickly enough and are failing to adequately manage risk.

Recent research at the London School of Economics and Political Science (LSE) considered the global imbalance between risk reduction, adaptation prevention efforts and recovery repair after an event. About 15% of global funds spent on disasters go into risk reduction prevention whilst 85% going into recovery repair.

There are very significant cost benefit ratios of acting on climate change from 1:2 up to 1:10 in terms of spend versus benefit, which are quite motivating to action.

## Measurement and evaluation

The Climate Change Committee (CCC) has a statutory duty to run a Climate Change Risk Assessment (CCRA) on a five-year cycle. CCC also checks and reports on adaptation progress every two years. The point of this report is to provide an evidence-based assessment of adaptation in the UK with progress scored across 14 areas. Plans and policies as well as evidence of delivery are assessed, taking into account quantitative and qualitative evidence.

The recent headline findings indicate that there is inadequate progress particularly with regards to delivery. It is, however, often difficult to provide good evidence and to come up with robust assessments - not having evidence does not necessarily mean that nothing is happening, but this highlights the importance of tracking and recording adaptation evidence.

The Third National Adaptation Programme (NAP3) includes an extensive piece of work on monitoring and evaluation aiming to develop new indicators on outcomes. This will help to improve understanding of what success looks like on adaptation.

## Current levels of implementation in the UK

There is definitely more consideration of climate change and more evidence of plans and policies in place. But what we are not seeing is the evidence of delivery. We should be far ahead of this, and the urgency and costs are increasing. In addition, the extent to whether these policies and plans are credible is in question. The CCC Progress Report found that only five out of 45 outcomes assessed had credible plans in place.

Whilst plans and policies should be in place after three rounds of CCRAs, implementation and delivery are also challenging. For example, there is often the question of who will pay, by when and how much. But there needs to be a focus on delivery and on the funding and the investment that comes with it. We should be in a phase where we're moving from plans and policies and assessing and understanding the risk and understanding to delivering adaptation. We also need to ensure that policies that are in place are not making the risk worse or not contributing to resilience.

## Third National Adaptation Programme

As established through the Climate Change Act 2008, the Climate Change Risk Assessment is followed about 18 months later by a National Adaptation Programme (NAP). NAP3 was published by Defra earlier this week and responds for the first time to each of the 61 risks identified in the risk assessment. Defra will also respond directly to the CCC's Adaptation Progress Report in October.

The risks in NAP3 are split over five sectors – infrastructure; natural environment; health, communities and the built environment; business and industry; and, for the first time, international dimensions.

NAP3 is a five-year programme which includes a capacity building programme across government to ensure that they embed understanding and really drive actions. Supplementary guidance on adapting to climate change, which will be updated, is also a significant piece of work and is what departments use to guide decisions on spending.

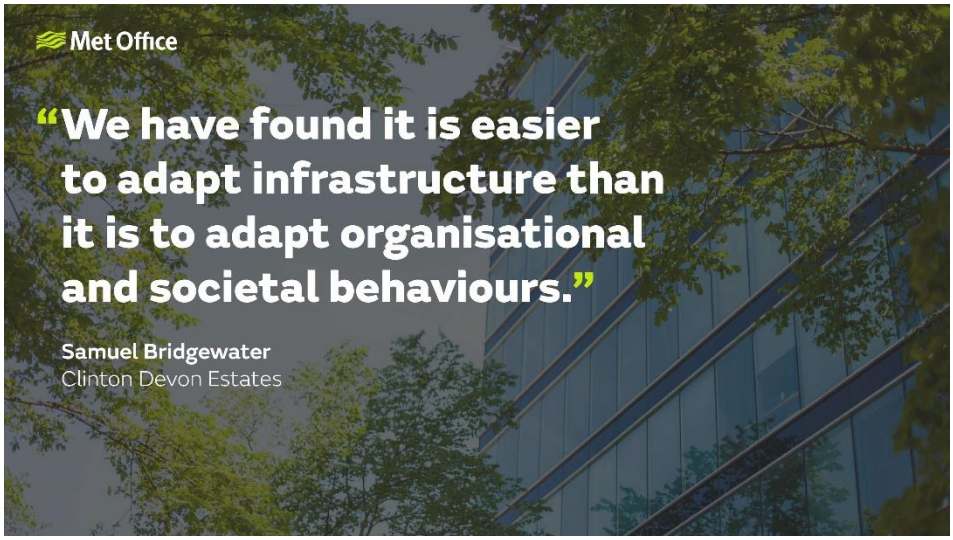
Further key features of NAP3 include a new £15million fund with UK Research and Innovation (UKRI) to support the research and innovation needed to deliver adaptive actions, and a new offer with the Met Office to all local authorities, sharing climate projections and data so that they are equipped with information to be able to plan adaptation at the local level.

## Adaptation in practice

### Lower Otter Valley – Clinton Devon Estates

The Lower Otter Valley is heavily modified by human hand. The main modification is an embankment that was built in the early 19th century, canalising the river and disconnecting it from its entire floodplain. Since that time there have been lots of other modifications including a cricket club, the lowest cricket club in England, within the floodplain. There is also a municipal tip in the middle of the floodplain, a road that goes across it, and an old railway line. Historically, when this floods, the water gets trapped behind lots of infrastructure and can't get back out to sea or join the river.

This is creating many problems, the most obvious one being that the embankment is in danger of catastrophic breach. It almost breached in 2018 and again in 2020. If it was to breach, the sea would come up the valley, and the cricket club would be lost, the road would be tidal and under 80% percent of all high tides, and a lot of infrastructure, including part of the South West Coast Path, would be compromised.



In the absence of infinite amounts of public money, the sea will come up the valley, and Clinton Devon Estates wanted to pre-emptively manage that process. This means is that the embankment will soon be breached allowing the tide up the valley. The cricket ground has already been relocated and the road has been moved and raised. The tip has been capped and protected and the creak network has been dug in preparation for the breach that will be happening in the autumn. There is also new visitor infrastructure and raised and improved public access. As part of the South West Coast Path, this area includes one of the busiest footpaths in Devon.

Clinton Devon Estates have found that it is easier to adapt infrastructure than it is to adapt organisational and societal behaviours and have worked closely with a wide range of organisations, stakeholders and the public to co-develop the plans and implementation.

In terms of measurement and evaluation, baseline information was captured at the beginning of the programme and will be looked at again after five and 10 years. This includes everything from property prices to health and wellbeing, people's enjoyment of the site and the costs of various authorities in managing their assets.

### Floods, pollution and water management – JBA Consulting

JBA Consulting use climate change projections such as UK Climate Projections (UKCP) to aid understanding of risk and to assist their clients in adapting to become resilient. This includes using a convective-permitting model for the whole of the UK run with 12 different ensemble members, to understand rainfall intensity at fine scales across the UK.

Most recently this data was used for a project for UK Water Industry Research (UKWIR). This research has enabled development of a tool that can change historic rainfall into a future estimated time series of rainfall. The tool enables users to feed in historic rainfall records and carries out a perturbation process to produce synthetic rainfall that represents future changes in event intensity and other features such as extended dry day periods. It's not just rainfall intensity that increases, but there are also subtle changes within the rainfall through the year.

These data are really important for water companies who use them in sewer models which determine the volume and frequency of spills from combined sewer overflows and to size new storage facilities. The additional information provides a much better understanding on what will happen in the future based on much more high-resolution tools than have been available in the past. This leads to two types of adaptation which can be applied:

- Adaptive/managed adaptive approaches tackle a small amount of the risk at a time, often with upstream measures such as improved drainage. These can be a lot more cost effective and have other environmental and societal benefits.
- Precautionary measures tackle a large amount of risk through costly and potentially very disruptive work such as replacing and upsizing a main sewer.

Internationally, Niger in West Africa has been hit by enormous floods in the last few years, but also has significant problems with water resource management in drier periods. JBA Consulting has used a range of climate projections to inform flood risk maps for urban areas in Niger. The types of adaptation measures that are appropriate are again precautionary and adaptive; for example, measures to manage water and reduce flows that increase water availability in drier times, as well as hard defences that may need to be raised. To decide how high to build such defences requires information about how high flood water levels are likely to be both now and in the future.

## Final summary

Climate risks are already happening with ongoing impacts. As a global community we are committed to further warming and impacts, as we have failed to reduce emissions quickly enough and are failing to adequately manage risk. There are very significant cost benefit ratios of acting on climate change from 1:2 up to 1:10 in terms of spend versus benefit.

The Climate Change Committee reports on adaptation progress every two years, providing an evidence-based assessment of adaptation in the UK. Recent headline findings indicate that there is inadequate progress particularly with regards to delivery. We should be in a phase where we're moving from plans and policies and assessing and understanding the risk and understanding to delivering adaptation. We also need to ensure that policies that are in place are not making the risk worse or not contributing to resilience.


The Third National Adaptation Programme (NAP3) was published by Defra earlier this week and responds for the first time to each of the 61 risks identified in the risk assessment. NAP3 is a five-year programme which includes a capacity building programme across government to ensure that they embed understanding and really drive actions.

When it comes to adaptation in practice, co-developing adaptation measures is vital to help gain buy-in for work that is necessary and to help change organisational and societal behaviours. Measuring the impact of individual measures can also be more straightforward at a local level, but work needs to be undertaken to baseline, track and record evidence.

Two types of adaptation were highlighted - adaptive/managed adaptive approaches tackling a small amount of the risk at a time; and precautionary measures tackling a large amount of risk.