

Adaptation for sustainable economic growth

Final Summary Report - Adapting to unavoidable climate change in the northwest of England



Northwest Climate Change Partnership

Prepared by Matt Ellis
North West Climate Change Adaptation Coordinator
Environment Agency
March 2011

Section 1 – Delivering a Well Adapted North West

1.1 A Changing Climate:

Climate change is a global problem, expressed locally. And whilst there is uncertainty in the sensitivity of climate to the changing atmosphere and future greenhouse gas emissions, the following broad changes are unavoidable and already locked into the climate system:

- Hotter drier summers
- Shorter but warmer wetter winters
- Increases in sea level
- Increased storminess
- Increased incidence of extreme weather events (such as storms, high winds, heat waves and flooding but also potentially periods of extreme cold)¹.



1.2 A Vision for Adaptation

In response our **priority** for climate change adaptation in the North West of England is to become “well-adapting by 2020”. This is set out in the North West Climate Change Action Plan: Rising to the Challenge².

The development of a **North West Climate Change adaptation framework** (NWCCAF) has provided the opportunity to understand whether our current activities to adapt to CC are sufficient or whether there are issues which need further focus and support before we can call ourselves ‘well adapting’. This approach has not been attempted by any other English region at this scale and will provide DEFRA with a key additional locally driven input to the national adaptation programme.

It’s development has been informed by a consultation³ of 150 organisations and individuals with a good coverage of responses received back from Local Authorities and their emergency service partners, rural and environmental interests. Private sector and wider public sector response was minimal.

1.3 This Document

This document:

- **Sets out** the national context for Climate Change Adaptation;
- **outlines** the expected broad climate change impacts the North West’s businesses, communities and environment will face;
- **highlights** the significant thinking and activity to manage these that is **already** happening;

¹http://www.climatechangenorthwest.co.uk/assets/files/documents/jun_09/cli_1245345731_NW_UKCP09.ppt

²http://www.climatechangenorthwest.co.uk/assets/files/documents/feb_10/cli_1265921054_NW_Climate_Change_Action_Plan.pdf

³<http://www.climatechangenorthwest.co.uk/news/archive/northwest-adaptation-framework-consultation-now-open.html>

- **Summarises** the NWCCAF's initial assessment of the adequacy of our current climate change adaptation activity
- **Identifies** gaps in our capacity and preparedness and possible areas for further action and support needed to address these

1.4 The National Context:

Climate change represents a large scale, long term and significant challenge and adaptation sits at the top of the UK's five point plan for climate action⁴.

Consequently climate change adaptation is an ongoing governmental priority⁵ with an established cross government programme of research and action, including completion of the UK's first Climate Change Risk Assessment⁶ (CCRA).

The CCRA will give us a better understanding of the climate change challenges that are **already** being managed through public sector activity, legislation, regulation and the operational activities of a range of critical infrastructure and other public and private sector bodies. However, there will be impacts that we:

- currently **don't** manage;
- have very little or **no** capacity to manage;
- will **always** see some level of residual risk from; or
- have **identified** for certain individuals, organisations or sectors as key vulnerabilities.

The management of these will be the focus of the first five year National Adaptation programme (NAP), starting in 2012. This NAP will have a significant local delivery element, particularly around public, private and civil society action! There is a strong expectation within DEFRA of the role of the public sector in delivering CC adaptation.

Understanding the North West context for these impacts is important as it will set the overall context for adaptation activity and will provide the framework within which we will need to deliver effective adaptation at a North West sub-national level.

1.5 Climate Change impacts in the North West:



The increasingly visible impacts of climate change affects the North West directly and indirectly (and will continue to do so). Direct impacts are expressed on local activities (i.e. flooding). Indirect impacts are expressed on external markets, supply chains and on labour movements, both in the UK and beyond.

Over time our communities will continue to experience increasing temperatures, high winds and storms, Sea level rise, storm surges and exposure to all sources of flood risk⁷.

⁴ http://www.decc.gov.uk/en/content/cms/what_we_do/change_energy/tackling_clima/five_point_pla/five_point_pla.aspx

⁵ reinforced by Carline Spellman (Secretary of State for Department of Environment, Food and Rural Affairs) in September 2010 by stating that 'Tackling and adapting to climate change is a top priority for this Government – at home and internationally.'

⁶ <http://www.defra.gov.uk/environment/climate/adaptation/ccra/index.htm>

These could lead to social and economic consequences for:

- spatial decision making, health, logistics and the management of people and property and delivery of services;
- increased damage to infrastructure which provides services to the public and supports wider economic activities;
- disruption of resilience of the North West's supply chains; and
- impacts on our agriculture, utility and manufacturing sectors from water shortages and damage from extreme storm events.

The changing climate will also have impacts on the North West's natural environment and the activity and services it supports from:

- changes in the timing of seasonal events and agricultural practices and/or their intensity;
- potential changes in the availability and use of water and the impacts of drought;
- direct loss of habitats, species and their distributions from coastal squeeze, impacts of extreme temperatures, flood risk, storm and fire damage.



This potentially not only detracts from their nature conservation and landscape value but also from the ecosystem and CC adaptation services they themselves provide (such as storages of flood water).

But some positive impacts may emerge as a result of climate change including:



- less need for space heating;
- a potential decrease in cold related winter mortality;
- economic benefits from the delivery of CC adaptation goods and services (i.e. flood resilience products);
- growth in the visitor economy (i.e. through increased demand for outside leisure/living activity); and
- opportunities for higher value agricultural crops.

Photo: Susannah Gill www.qinw.co.uk/climatechange

There are also potential international market opportunities for locations that have the capacity and infrastructure to manage these impacts.

⁷ Fluvial, tidal, ground and surface water and sewer flood risk

Section 2 – Our Capacity to Adapt

2.1 Assessing capacity

As part of the NWCCAF a high level assessment was undertaken of the **current** level of adaptation activity and performance in the North West – our capacity to adapt!

This was done for each of the 3 main climate change impact areas of flood risk, water resources and higher temperatures. This assessment also considered whether current spending restrictions and uncertainties around resource availability and/or organisational capacity affected delivery in the shorter term and was split into the areas of:

- **understanding and planning** for impacts (i.e. mapping flood risk and preparing flood risk strategies/heat wave plans etc);
- taking action to **reduce exposure** to the impact (i.e. constructing physical flood defences/developing additional supplies of water); and
- **reducing the consequences** of the impact (i.e. timely flood warning/emergency response or building flood/heat resilient structures and infrastructure).

As a result we have assessed the various CC adaptation activities and scored them. This scoring runs from: green where the activity fully addresses CC, yellow where issues like current resourcing affects delivery, amber where the activity only partially addresses CC; through to red where there is no real consideration at all⁸.

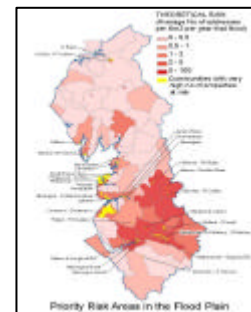
The table below sets out the overall summary assessment of the main CC impact areas.

	Flood Risk	Water Resources	Higher Temps
Understanding and planning	Y	Y	Y
Reducing exposure	A	Y	R
Reducing consequence	A	A	A

The following sections sets out in a little more detail the assessment of each of 3 CC impact areas.

2.2 - Flood and coastal risk management in a changing environment

Understanding and Planning – We currently assess, map and plan to manage fluvial and tidal flood risk. New legislation and regulations⁹ will extend the level of activity and responsibility for **all** sources of flooding to certain local authorities (i.e. producing preliminary flood risk assessments). There is also a move towards a more holistic, multi-agency and community focussed approach to flood planning



These activities have strong and even legislative drivers but meeting and supporting these roles and new duties does have significant resource/skills implications at a time of public sector spending restrictions and organisational change.

⁸ full details and justifications can be found within section 3 of main NWCCAF document

⁹ 2009 Flood Risk Regulations, 2010 Floods and Water Management Act



Reducing Exposure – Capital flood defence assets (including natural FD features like storage/wetlands) are designed and maintained provides reductions in current and future flood risk. Certain land management practices can help manage and reduce flood risk. The planning of new development (its location, type and form) also effects the extent to which people are exposed to current and future flood risk.

Even though this investment takes account of climate change, current capital and revenue spending restrictions may limit direct physical management of flood risk. There has also been fairly limited application of wider land management interventions to deliver FRM (though emerging pilot studies¹⁰ should improve understanding and uptake).

Forthcoming revisions to the spatial planning system and its policy framework may also impact on its ability to consider flood risk, particularly any wider consideration of all sources of flood risk and addressing off site and pan authority impacts.

Reducing consequence – We have a system of flood warning in high fluvial and tidal flood risk areas. A well established emergency flood response system also exists¹¹ and flood resilience measures can be considered in new development.

However, these warning systems do not yet cover surface water flood risk areas and the spending cuts will have some impact on emergency response. Also, not everyone is aware of their risks, knows how to act during a flood event or even actively chooses to access these warning systems (though development of a more locally focussed approach to flooding, including community flood wardens should improve this). And despite emerging small scale pilots, we still lack information, materials and/or assessment services by competent bodies for identifying mechanisms to implement practical flood resistance & resilience measures within existing developments.



2.3 Water Resource Management in a changing environment

Understanding and Planning – United Utilities is required to produce a 25 year Water Resource Management Plan (WRMP) and shorter term drought plans.. Environment Agency Catchment Abstraction Management Strategies guide regulatory and wider abstraction licences/permits processes and guidance covers how these processes and plans (and EA regulation of them) takes account of climate change. National Planning Policy provides guidance to LA's on how to take account of CC and the water resources impact of future growth should be taken account of in the Local Development Framework (LDF) process.

¹⁰ EA pilots in the Derwent and Cocker catchments and the Peatscapes and Moors for the future projects)

¹¹ 2004 Civil Contingencies act

These activities are therefore underpinned by a robust guidance and regulatory framework. But sometimes information on future development is provided either without enough certainty or within the timescales of UU's strategic planning processes to enable effective consideration of growth within the WRMP (especially now RSS no longer provides a strategic planning and evidence tool). Again, and maybe down to the timing of spatial and water resource planning processes or the spatial scale of information within the WRMP, the water resource impacts of longer term average growth trajectories tend not to inform more local levels or locations of growth in LDFs in the NW, even if these are identified in Sustainability and Habitats Appraisals.

Reducing exposure – UU's five year investment and planning cycles are informed by the planning processes outlined above. These identify necessary development of additional supplies, increased asset or demand management.



The Environment Agency's regulation of this process and its licensing and permitting activities considers environmental issues and the security of and resilience of supplies to climate change.

However, if UU's involvement in the spatial planning system occurs too late or is ineffective, they can still see unexpected levels and locations of growth within AMP investment cycles which can cause problems supplying development. Also UU's regulated supply and demand management activities can have impacts on the natural environment and the conservation and environmental services it provides, especially in non-designated areas. This can affect the natural environments own ability to adapt to climate change, especially at times of drought.

Reducing Consequences – During droughts water needs to be managed on a day to day operational basis (i.e. putting restrictions on certain uses). These operational controls are underpinned by robust planning and regulatory processes.



There are also longer term activities to achieve a more general management of demand (leakage reduction) and delivering increased levels water efficiency (i.e. water efficient products, precision farming etc). Building Regs requires require certain minimum water efficiency standards to be met and planning can be used to set higher standards for certain types of new development for CC reasons .

However, current mechanisms to manage demand don't cover existing developments or certain sectors which contribute significantly to water use. BREEAM standards to cover non-residential development don't set minimum requirements for water use and personal water use behaviour massively affects demand but is outside the scope of any real control. The forthcoming revisions to the spatial planning system and its policy framework and the loss of RSS as a strategic evidence base may mean that core strategies and development management decisions do not require or encourage higher levels of efficiency. .

Our ability to achieve higher levels of water efficiency and leakage reduction might be limited. There are also some concerns over the level of environmental protection provided during droughts (especially outside of designated sites).

2.4 Managing temperatures in a changing environment

Understanding and Planning – Guidance and plans exists on planning for heat impacts. For example, the National Heat Wave Plan and Highways Agency adaptation strategy sets out the operational responses and activities required to respond to higher and extreme temperatures. The current national planning policy framework also sets out how climate change, including heat issues, should be taken account of within LDF's.

However, the guidance tends to be extremely light in terms of CC and heat issues (i.e. DFT Guidance on the LTP3 process just states they should consider CC with no further details). They also often only cover certain activities (i.e. new public capital expenditure on buildings but not operational issues). Spending restrictions and organisational change may more generally reduce capacity to understand and plan for higher temperature, especially through spatial planning.



Reducing exposure - The careful design and management of our built environment can help mitigate and adapt to the potential impacts that higher temperatures. Building Regulations require certain minimum considerations to be given to ventilation and heat gain in buildings. Evidence is also growing on the increasingly important role in the future of green and blue infrastructure in managing these impacts by providing essential cooling effects, particularly in our heavily built up urban areas. Under the CC act, critical infrastructure providers are required to ensure resilience and continued minimum service levels during extreme temperature events and some publicly financed buildings are being designed to meet higher cooling and performance standards..

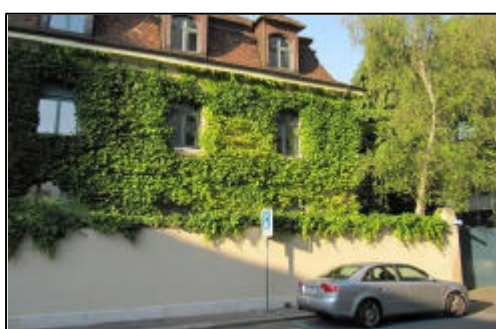


Photo: Susannah Gill www.qinw.co.uk/climatechange

However, again much of the guidance lacks real practical detail of measures to take. Any consideration within Building Regs is from an energy efficiency not temperature management point of view. There are very few other incentives to drive this agenda and current sustainability standards tend not to specifically address heat and are not applied to all new development.

There is growing guidance and evidence on the role of blue/green infrastructure and other natural/passive cooling /tree shading of our urban areas. However, there is, as yet, very few actual examples of new or existing areas of green infrastructure or built environments being planned or delivered in ways which addresses higher temperatures. We also lack mechanisms to address existing buildings which cant cope with increased temps, especially where these cant be easily (cheaply) retrofitted or only addressed in a way which increases energy consumption.

Therefore it is unclear, beyond critical infrastructure providers and certain parts of the public sector, how far public (or private) investment in new property and associated hard fabric is or will fully take account of current and/or future higher temperatures and extreme events.

Reducing consequences – Our comprehensive system of heat wave response (from preparedness to readiness, to action and then emergency response) is reviewed annually via the National Heat Wave Plan. Some business continuity and H&S and personal protective equipment processes already consider working in hotter temperatures and during extreme events. Thinking is also emerging on the impact of extreme heat on the natural environment. This is in terms of its own resilience to higher temperatures and increased demand for open space access in urban areas, outdoor recreation and changes to land management during hotter periods.



Photo: McCoy Wynne

There is little statutory guidance around higher temperatures and on setting actions for LA's and others in terms of service provision and building management. And where business continuity and H&S processes cover this, they appear mainly to be in public sector and larger private sector organisations and potentially only for current rather than future summer temperatures. Many individual organisations and businesses (particularly of critical public and private services and those working with or in the natural environment) need to start to consider the impact of more general temperature rise and heat wave events on their service levels. These considerations need to take account of the impacts over time with only minor changes needed to activities and structures by 2020 but recognising the need for planning for much more significant responses as we approach 2050 and beyond.

Section 3- Remaining CC vulnerability in the North West

3.1 Gaps in our adaptive capacity

From the assessment carried out within the NWCCAF we are comfortable that there are mechanisms in place to understand and manage climate impacts by providers of critical infrastructure. Emergency response is also well covered, certainly in terms of managing current extreme events which will provide capacity and experience going



forward. Many weather related impacts are currently managed and will continue to be. Some individuals may also benefit from changing climatic conditions or be able to take competitive advantage by putting in place the capacity to adapt (for example through adapting their own and their supply chains to allow continued economic production whilst others are disrupted). But gaps exist which mean we can not yet call ourselves 'well adapting'.

This may be because we lack of delivery mechanisms and/or capacity, resources or responsibility for planning and managing certain impacts (such as increased temperatures), particularly in the shorter term. There is certainly a more immediate and general across the board issue of resource and capacity deficits to support this Agenda. Partly these occur from current changes to public sector service delivery (i.e. loss of National Indicator 188 which drove climate change risk assessment and action planning within Local Authorities) and through reductions in funding availability. Our capacity to manage current weather related impacts may also not take account of or be sufficient to address the greater frequency and magnitude of extreme weather events expected as a result of climate change or the likelihood for these to happen at the same time.

There are also gaps because there will always be residual risks which the public sector and critical infrastructure providers will not manage. These risks and subsequent impacts and the responsibility for managing these therefore lies with private individuals and organisations themselves. It is currently unclear if they themselves have the understanding and capacity to manage these residual impacts.



Photo courtesy of Tony Beyga

In part this is because of the difficulty we have always had with engaging with and getting a response from these sectors on climate change adaptation. This inability, particularly with the private sector, means we currently do not have a clear idea whether these communities and businesses understand CC and its particular impacts on them. We also do not know if they are aware of how they may need to adapt or whether they have the capacity or resources to respond at the appropriate time.

Another factor is that levels of understanding and adaptive capacity may vary across the region because resources in supporting adaptation have not been targeted uniformly. There is certainly a perception within rural interests that this is due to the focus which has occurred on urban rather than rural areas. This is due in part to the higher numbers of population and the value of the assets and economic activity in these areas compared to rural locations. Whilst they do not feel that this focus is unexpected (or even wrong), they do feel that it can mean that the consideration of the adaptive needs of specific vulnerable populations in remoter areas is not resourced to the same extent. Their understanding and capacity to adapt potentially therefore is less and adaptive responses which work in more urban locations may not be as effective with these groups/locations.

Whilst we feel that in terms of our provision and management of critical infrastructure and our emergency response capacity is good, we still have gaps around our ability to manage the impacts of climate change, particularly around:

- **Adapting our places and wider infrastructure** by developing our capacity understanding to deliver the physical changes needed to adapt all parts of the North West (particularly through spatial planning);
- **Adapting our public services** by ensuring we put the changes in place to ensure continued service delivery in a changing climate but particularly ensure we can cope with increased demand for services both during extreme climate events and in the often lengthy but less well considered recovery/clean up phases;

- **Reaching our businesses and communities** by tackling a wider lack of private and individual awareness of the disruptive impacts of climate change on their interests, their own role in addressing these and how this changes over time; and
- **Delivering a resilient natural environment that helps us adapt** by enhancing the extent to which it provides us with adaptation and protecting its ability to do this by ensuring it can survive and adapt to a changing climate in itself.

3.2 Plugging the gaps - areas for future focus and support

We need to address the broad areas above if we are to turn some of the reds and ambers to yellows and greens and move ourselves towards becoming 'well adapting'.

Potential areas for focus and support to help address these challenges are outlined below.

- **Adapting our places and infrastructure** by:

- planning for all sources of flood risk and how new development affects and manages down stream flood risk;
- considering the impacts of growth levels and locations on our water resource availability and the role of higher levels of water efficiency within this (both new and existing developments);
- designing our new and regenerated buildings and spaces to deal with increased/extreme temps (particularly the role of GI and increasing its delivery); and
- understanding how and who will retrofit CC adaptation measures within our existing buildings and infrastructure(particularly measures to increase flood resilience and manage higher temperatures).



Photo: Susannah Gill www.qinw.co.uk/climatechange

- **Adapting our public services** by:

- Continuing, in the absence of NI188, to raise awareness of CC and the need to taken action by building on the progress made to date and increasing the use of risk assessments. This will facilitate the embedding of actions within risk management processes around managing the impacts of extreme events on service delivery, business continuity and the costs associated with managing these, both during events and in the often lengthy but less well considered recovery/clean up phases;



- understanding changes in level of demand for services or need for new/changed services as a result of climate change, both generally and in terms of particular user vulnerabilities (i.e. the needs of those in social care).
- embedding resultant CC adaptation considerations within operational, building and service management procedures, particularly in terms of

ensuring business continuity and how assets are physically used in a changed climate; and

- **Reaching our businesses and communities by:**
 - Encouraging the numbers of businesses taking action to adapt by increasing awareness of the climate change impacts on their activities; and
 - delivering information into communities in widest sense through existing (i.e. floodline) and future support arrangements.

- **Delivering a resilient natural environment that helps us adapt by:**
 - Understanding the role of Natural FRM and Land management practices and increasing its delivery;
 - Maximising the role Green Infrastructure plays in helping us combat climate change;
 - Increasing the role rural areas, and in particular farmed land, in protecting, restoring and maintaining habitats, species and landscape features needed for the natural environment to adapt; and
 - Supporting local the delivery of a robust set of ecological and green infrastructure networks to help wildlife and people adapt.



3.3 Taking this forward

Section 3.1 and 3.2 identify broad areas where we are less prepared and activities we could focus on to address these. However, in doing this there is an overarching need to address an emerging capacity and resource issue resulting from current public sector funding restrictions along with structural change.

We feel that these changes themselves represent barriers to adapting the North West to climate change. There are also changes (including the wind down and closure of the NWDA) which affects the form and functioning of the current North West Climate Change Partnership in the short term and has knock on effects on the NW Climate change Adaptation group, not least in terms of removal of future funding of various CCAP work streams.

As a result of all this change, consideration is needed on how we work together and how this fits with existing and emerging networks and programmes around climate change. A coordinated adaptation programme based on the findings of this framework would compliment and support the delivery of increased adaptive capacity in these areas. This could therefore have real value by helping us all maintain and build on the progress that has been made around this agenda over the last 10 years.

The **NW Climate Change Adaptation Group** has the potential to maintain and develop the necessary wider capacity and mechanisms within the North West. However, to do this we will probably need to consider how it is structured, operates and its resources as well as its membership. This will ensure it best supports wider engagement and delivery of climate change adaptation at both a Pan-Authority/LEP and more local business/community level.

This forum could do this by supporting activity across the four areas of focus above and may also enable us to have accountable body status needed to more effectively

secure additional resources to deliver a future adaptation support programme locally. It would also provide critical knowledge transfer, training and capacity for this agenda and ensure the wider benefits of this activity is shared amongst a variety of partners. For example, in the shorter term there are a number of ongoing support programmes which could contribute to the work of the adaptation group going forward. There are also activities and potentially resources and partners, including from the innovative work being done in our academic institutions which would add considerable value to this agenda. Potential activities (and therefore partners) which could sit and operate within this forum therefore include:

- Delivering the Climate Change Skills fund to ensure a legacy of support for spatial planners
- Maximising UU/EA strategic involvement and influence in spatial planning process.
- Rolling out learning from current land use management pilots and other natural environment and climate change processes into wider action on the ground.
- Work with stakeholders within Cheshire, Cumbria, Greater Manchester, Lancashire, and Merseyside to support the delivery of the green infrastructure to help combat climate change¹².
- Support Local Authority and partner services with CC risk assessments and the preparation and delivery of action plans.
- Increasing activity to better engage with local communities (particularly 'hard to reach' groups on climate change adaptation.
- Exploring how we could use the Environment Agency's own floodline to start the debate on how future risk may change.
- Investigate a better use of our business support organisations and other key outreach partners.
- Role out more local and multi agency approaches to flood planning.
- Continue support for the Natural Environment Organisations assessments of the future impacts of CC on North West habitats and species and delivery of actions to make them more resilient.



For further information contact:

Matt Ellis

North West Climate Change Adaptation Coordinator

Environment Agency

T: 01925 542171

M: 07736036353

F: 01925 234762

matthew.ellis@environment-agency.gov.uk

¹²http://www.greeninfrastructurenw.co.uk/resources/GI_and_CC_Action_Plan_Consultation_Draft_02.09.10.pdf