


YORKSHIRE AND HUMBER CLIMATE CHANGE ADAPTATION STUDY

LOCAL AREA REPORT

NORTH LINCOLNSHIRE DISTRICT

<p>Location</p>	
<p>Description of District</p>	<p>North Lincolnshire is predominantly rural with the heavily industrial area around Scunthorpe as the main urban area in the centre of this district.</p>
<p>Future Climate Projections</p>	<p>The results of the modelling carried out for the Yorkshire and Humber Regional Climate Change Adaptation Study suggest that the following changes are likely by 2050:</p> <ul style="list-style-type: none"> • Summer average temperatures are expected to rise by 2.3°C; • Although rising, winter extreme temperatures are projected to remain below zero; • Snowfall will reduce by 70% (two snow days) per year; • Winter rainfall will increase by 17% but average annual rainfall will reduce by 3.5%; and • Winter average wind speeds will increase marginally. <p>These figures relate to the nearest modelled cell, which was Hull.</p>

Key Impacts and Adaptation Actions

Although principally a regional / sub-regional study, there are a range of issues that are of particular relevance to the North Lincolnshire District. These are set out below, using the same 'sector' headings as the main report. These points are not the only issues for consideration, however, as sub-regional and regional reports, as well as the thematic or sectoral areas of the website, do cover other issues relevant to this local authority area.

Flooding

Key Impacts

- Greater rainfall leading to increasing and more frequent flood problems;
- Increasing potential for tidal flood impacts with rising sea levels;
- Particular surface water flooding problems due to low-lying areas; and
- Increased erosion and more frequent breaching of historic defences with greater and more prolonged loading requiring increased maintenance works.

Key Adaptations

- Protect critical infrastructure and emergency services;
- Concentrate improvements to tidal flood defences;
- Produce multi-agency response plans to co-ordinate responses during extreme events and ensure clear access routes are kept available; and
- Improve current drainage design standards to incorporate future climate changes, and strategically plan and implement system improvements across the drainage network.

Coastal Erosion

Key Impacts

- Increased rates of inter-tidal salt marsh-edge recession at some locations within the Humber Estuary, in many cases leading to the progressive 'squeezing' of inter-tidal habitats between a rising sea level and a fixed backstop flood defence structure or rising ground.

Key Adaptations

- Adaptation to inter-tidal salt marsh-edge erosion within the Humber Estuary is inextricably linked with flood risk management decisions. This in part will involve maintenance or improvements to existing flood defence structures, leading to continued coastal squeeze. In part it may also involve the abandonment or removal of existing defences, enabling marsh creation. The Humber Flood Risk Management Strategy outlines the different areas where defence improvements may be hard to justify but it may be many years before final decisions are taken on individual lengths.

Groundwater and Minewater

Key Impacts

- Risk to Chalk groundwater resource due to declining groundwater levels and increased drought;
- Impact on river flows due to reduction in spring flow from Chalk; and
- Risk of saline intrusion, although this is particularly the case around Grimsby.

Key Adaptations

- Continued monitoring and careful exploitation of the Chalk aquifer; and
- Assessment of saline intrusion and possible constraint of groundwater abstractions during periods of drought.

Business and Economy

Key Impacts

- Increases in pest and disease spread, together with the potential for more 'exotic' species, are likely to have significant effects on the district's agriculture;
- Industrial processes, and in particular those requiring large amounts of water may be impacted by water shortages. Heavy users may find limitations imposed in order to balance industrial and other needs, which could reduce process efficiency and output and increase costs.
- The distribution and logistics sector is susceptible to flooding and heat impacts at warehouse and distribution park sites. It is also heavily dependent on the activities of the ports and the wider transport network.

Key Adaptations

- Initiate, develop and review pest management strategies, in particular associated with the ports, to ensure the early identification and treatment of any species or conditions which may negatively affect the region's habitats, agriculture, or human health;
- More water efficient industrial practices, including measures to limit reliance on piped water (eg rainfall capture and reuse systems) may increase resilience of industry to the drought effects of climate change. Build climate adaptation into regular industrial process reviews, and programme any necessary adaptations into maintenance and upgrade cycles; and
- Flooding impacts on distribution and retail parks should be addressed as a priority before development, with surface water management plans and sustainable drainage systems, designed to cope with future water flows, integrated into the developments from the outset. Greater resilience of supply networks can also be developed through increasing storage, reducing the impacts of disruption.

Public and Voluntary Services

Key Impacts

- Indoor air temperatures are likely to rise in the summer in schools and public buildings, particularly in urban areas, with impacts on air quality;
- With the expected increase in winter rainfall and extreme rainfall, localised flooding events will become increasingly frequent and intense, impacting buildings as well as social housing residents, housing association, public services and emergency service ability to operate.

Key Adaptations

- A set-aside maintenance and repair budget for school buildings and public service offices, developed through adapting current budgetary mechanisms, would ease the costs of any damage that is incurred as a result of climate impacts. This budget should also be used to upgrade to appropriate guttering and sustainable drainage systems, green roofs, water butts, grey water systems, passive ventilation and shading, and renewable sources of energy; and
- Local authorities and regional bodies should ensure full participation in regional resilience forums and regional flood groups and undertake precautionary as well as adaptive measures.

Infrastructure and Utilities

Key Impacts

- Surface melt of rural road surfaces and associated knock-on effects;
- Increased number of traffic accidents delays on major highways caused by increased winter rainfall and winter average wind speeds;
- Increased frequency of flooding from urban drainage and sewer systems in Scunthorpe, especially in winter;
- Increased demand on water resources, particularly from agriculture;
- Increased blockage of drains, culverts and gullies;
- Mechanical operations within the water distribution grid covering the western half of the district could be affected by climate-related disruption to power supplies;
- Water resource issues due to nature of supply source and being part of a different water company area than most of the region; and
- Increased scour of river bed around bridge pier foundations.

Key Adaptations

- Allow additional resources for use of alternative road surfacing materials in carriageway maintenance programs;
- Weather and travel warnings issued to users of principal road networks during forecast storm events and anticipate increased resource requirements for emergency responses;
- Capital programs should consider improved sewer/drainage design;

- Farm-holdings to consider local winter water storage reservoirs;
- Re-evaluate resources and approaches for inspection and clearance of drain, culvert and gully blockages;
- Increased awareness of inter-dependencies between critical infrastructure;
- Cross-organisational awareness and joint working between the two water companies; and
- Monitoring and scour protection around bridge pier foundations.

Biodiversity

Key Impacts

- A likely loss of salt and freshwater wetland to coastal squeeze;
- Increasing saline influence due to sea level rise and coastal flooding may increase the coverage of specialised species; and
- Climate change is expected to put pressure on future food production.

Key Adaptations

- Wherever possible allow natural processes to continue, and therefore adaptation to change to occur naturally;
- Facilitate an overall expansion in habitat types currently suffering from isolation or fragmentation. The overall connectivity of existing and newly created habitats needs to be enhanced to enable species to migrate and disperse easily;
- Integrate biodiversity objectives with coastal and agricultural planning, ensuring a joined up approach; and
- Maximise the potential for different habitats and species to help sustain each other. New habitats may take on functional roles such as buffering natural hazards such as wind, flooding and drought.

Health and Welfare

Key Impacts

- Impacts upon mental and physical health due to increasing temperatures, particularly in areas of deprivation; and
- Coastal and fluvial flooding attributable to sea level rise and increased seasonality and intensity of rainfall.

Key Adaptations

- Raising awareness, educating and building community resilience to climate change and its likely impacts. Target vulnerable groups as reducing social and economic inequalities will allow people to more easily adapt to the impacts of climate change; and
- Rainwater capture and harvesting and associated flood preparedness work with vulnerable communities will help build resilience and avoid potentially devastating impacts.