


YORKSHIRE AND HUMBER CLIMATE CHANGE ADAPTATION STUDY

LOCAL AREA REPORT HARROGATE BOROUGH

<p>Location</p>	
<p>Description of District</p>	<p>Harrogate is a rural borough, comprising agricultural land surrounding the urban area of Harrogate City.</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"> • Annual average daily mean temperature is to increase by 1.9°C; • On average there will more than 3 more hot days (over 28°C) annually; • There will be an overall reduction in extreme rainfall events, but winter rainfall will increase by 15%; and • Average annual wind speeds will reduce marginally but with winter wind speeds increasing. <p>These figures relate to the nearest modelled cell, which was York.</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 Harrogate Borough. These are set out below, using the same 'sector' headings as the main report. These points are not the only issues for consideration, however, and should not be read in isolation. 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

- Increased flooding to critical infrastructure and services as well as businesses and housing stock;
- Greater flood risk (fluvial, sewer/drainage, and from direct surface runoff) due to faster flood flows off the Yorkshire Dales; and
- Key risk to highly vulnerable caravan parks and camping sites in popular tourist areas.

Key Adaptations

- Protect critical infrastructure and emergency services;
- Develop flood management strategies to protect local businesses and properties, or encourage flood-resilience of buildings where this is not viable; and
- Ensure appropriate planning regulation is undertaken for caravan and camping parks with increased tourism.

Groundwater and Minewater

Key Impacts

- Risk of subsidence due to gypsum dissolution in the area between Ripon and Bedale during drought periods and / or during periods of intense rainfall; and
- Unquantified, generic risk of minewater outbreak from abandoned metal mines in the headwaters of the River Nidd and tributaries Ashfold Side Gill, Blayshaw Gill and How Gill caused by increased frequency of multi-day rainfall events.

Key Adaptations

- Monitor areas already undergoing subsidence and implement measures to limit further subsidence if required; and
- Risk is low due to areas being sparsely populated. Collation of existing water quality / hydrogeological data would assist in determining the exact nature and extent of outbreak risk.

Business and Economy

Key Impacts

- Management of sports venues and heritage and amenity sites will be affected by changing temperatures and rainfall/storm patterns. This will affect the grounds maintenance, the fabric of buildings, and health and wellbeing. Crowd and visitor management strategies may need adaptation, and festivals and outdoor events may become more susceptible to disruption from weather;
- Higher summer temperatures are expected to increase demand for leisure and tourism, including business tourism already prevalent in the area; this is likely to be accompanied by an extension of the tourist season. However, increased numbers of tourists may place significant strain on existing attractions and infrastructure; and
- Digital industries will be particularly vulnerable to effects on telecommunications infrastructure, and to the effects of increased flooding on data storage and electrical services.

Key Adaptations

- Long-term changes in the tourism industry should be built into visitor management strategies, and the expected future needs and demands of increased numbers of tourists should be built into infrastructure and other regional plans;
- Raise awareness of the impacts of climate change among the digital industries and those business sectors heavily reliant on data transmission and storage. In tandem, ensure that networks and transmission infrastructure is adequately designed; and
- There is potential for expansion of woodland areas as part of wider catchment and flood management schemes in order to ameliorate flood risks downstream.

Public and voluntary services

Key Impacts

- Much of Harrogate's social housing stock is pre-1980s and will be vulnerable to changes in structural (e.g. subsidence) and environmental forces (e.g. increased intensity of rainfall) due to climate change.
- While fuel poverty may decline during winter months, summer heat waves will make homes less comfortable, particularly for the elderly and vulnerable.
- Lower summer rainfall and higher temperatures may need consideration in design and management of public open spaces, particularly regarding planting of suitable drought-tolerant species, water features, shading and grass cutting operations.

Adaptation measures

- There are significant opportunities for housing refurbishment. Linked to those measures under the overarching adaptation measures is the refurbishment of housing stock in relation to energy efficiency, and to build in resilience;
- Climate change adaptation activity and refurbishment could start by using the index of multiple deprivation to identify priority areas and help take forward community scale NI 188 assessments;
- Planning of greenspace and green infrastructure must take full account of future impacts climate change. This will need to consider species choice, management regimes, and future use of the spaces, and could be delivered through eg Local Strategic Partnerships.

Infrastructure and Utilities

Key Impacts

- Surface melt of rural road surfaces and associated knock-on effects;
- Increased number of traffic delays on major highways;
- Increased demand on water resources, particularly from agriculture;
- Increased tourist and recreational use of Nidderdale;
- Increased blockage of drains, culverts and gullies; and
- Mechanical operations within the water distribution grid could be affected by climate-related disruption to power supplies.

Key Adaptations

- Allow additional resources for use of alternative road surfacing materials in carriageway maintenance programmes to ensure higher melt resistance;
- Weather and travel warnings issued to users of principal roads;
- Farm-holdings to consider local winter water storage reservoirs to assist with summer irrigation or livestock watering;
- Plan for increased visitor numbers and provide additional transport;
- Re-evaluate resources and approaches for inspection and clearance of drain, culvert and gully blockages; and
- Increased awareness of inter-dependencies between critical infrastructures, leading to improved resilience planning.

Biodiversity

Key Impacts

- Heavy rainfall could enhance localised erosion risk to peat bogs, particularly when combined with other pressures such as recreational disturbance and extraction; and
- Calcareous grassland may be prone to further loss due to the combination of existing pressures plus climate change.

Key Adaptations

- Monitor erosion and other visitor pressures, and where necessary respond with management, restoration, or by limiting access;
- An overall expansion in habitat types currently suffering from isolation or fragmentation, to improve habitat permeability. The overall connectivity of existing and newly created habitats needs to be enhanced to enable species to migrate and disperse easily; 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; and
- Increased likelihood of flooding due to greater winter rainfall totals and heavier individual rainfall events.

Key Adaptations

- Building, and enhancing existing, networks of support and healthcare services to cater for an increasingly elderly population;
- Raising awareness, educating and building community resilience and improving flood preparedness, including making maximum use of rainwater capture and harvesting.