


# YORKSHIRE AND HUMBER REGIONAL CLIMATE CHANGE ADAPTATION STUDY

## LOCAL AREA REPORT

### BARNSLEY METROPOLITAN BOROUGH

<b>Location</b>	
<b>Description of Area</b>	<p>The Metropolitan Borough of Barnsley is dominated by numerous small villages within the Peak District National Park, with the urban area of Barnsley town and the surrounding suburban housing.</p>
<b>Future Climate Projections</b>	<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"> <li>• Annual average temperature is projected to rise by 1.9°C;</li> <li>• Summer temperatures are to increase and there will be ~5 more ‘hot’ days per year (temperatures over 28°C);</li> <li>• Summer hot days will increase by 5 days; and</li> <li>• Winter rainfall is expected to increase by 14% and although extreme rainfall events will reduce overall they will increase in the winter months.</li> </ul> <p>These figures relate to the nearest modelled cell, which was Sheffield.</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 Barnsley 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*

- Flood risk to local businesses and properties from flood flows off the Pennine moorlands is likely to increase, with enhanced seasonality of rainfall bringing more flashy flood flows, particularly in the summer;
- Increased watercourse blockages and siltation reducing channel capacity and requiring greater maintenance works. Culvert entrances becoming blocked by tree debris and vegetation during high storms; and
- Increased surface water flooding in heavily urbanised areas during higher intensity, more extreme storms, and also affecting low sections of roads and railways.

#### *Key Adaptations*

- Continue river flow monitoring for fluvial flood events to provide advanced flood warning to critical risk areas;
- Concentrate flood management on protecting critical infrastructure, assets and services. Consider appropriate flood management information and strategies, including increased maintenance, to help protect local businesses and properties; and
- Improve current drainage design standards to incorporate future climate changes, and strategically plan and implement system improvements across the drainage network. Consider a wide range of flood reduction techniques across urban areas.

### Groundwater and Minewater

#### *Key Impacts*

- There is a low risk of increased incidence of outbreak from abandoned coal mines in the south and east of the district despite projected increased rainfall.

### *Key Adaptations*

- Continued Coal Authority monitoring. Existing and planned remedial schemes (e.g. Bullhouse, Silkstone and Cranberry Holes Dyke) at the most polluting sites will limit the potential for and impact of outbreaks. Pumping operations, which will likely be expanded (e.g. at Stafford near Dodworth), will limit the outbreak of rebounding mine waters.

## **Business and Economy**

### *Key Impacts*

- Digital industries will be particularly vulnerable to effects on telecommunications infrastructure, and to the effects of increased flooding on data storage and electrical services; and
- Impacts of climate change on the built environment, in particular business premises, will have a significant effect on employee and customer wellbeing; and
- Warehouse and distribution parks are susceptible to flooding and heat impacts, as well as being heavily dependent on the wider transport network.

### *Key Adaptations*

- Raise awareness of the impacts of climate change among the digital industries and those business sectors heavily reliant on data transmission and storage. Also ensure that developing networks and transmission infrastructure are adequately designed;
- Particularly bearing in mind the high levels of regeneration targeted within the district, climate adaptation should be built into all new developments to ensure working and other conditions are maintained at an agreeable standard into the future;
- Increased use of shade trees in urban areas will have positive effects on temperatures, limiting the heat island effect through shading and evaporative cooling. Their appropriate adoption in new developments and inclusion in redevelopment or renovation schemes should be encouraged; 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.

## **Public and Voluntary Services**

### *Key Impacts*

- Indoor air temperatures are likely to rise in the summer months, particularly where there is less relief from cooling overnight. This will have an impact on indoor air quality affecting school classrooms, local authority, emergency and military offices and social housing; and

- With the expected increase in winter and extreme rainfall, flooding events will become increasingly frequent and intense, impacting on 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. Maintenance and repair budgets should give due consideration to appropriate guttering and sustainable drainage systems, green roofs, water butts, grey water systems, passive ventilation and shading, and renewable energy. Low-carbon technologies should be adopted wherever possible as reliance on traditional mechanical cooling will further exacerbate climate change; and
- Ensure participation in regional resilience forums and regional flood groups and undertake precautionary as well as adaptive measures recommended, in addition to reviews of the risk register.

### **Infrastructure and Utilities**

#### *Key Impacts*

- Occasional deficits in volumes in individual surface water reservoirs;
- Increased frequency of flooding from urban drainage and sewer systems in Barnsley, especially in winter;
- 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*

- Balance water supply from other local sources or from the Yorkshire Grid at times of individual reservoir deficits;
- Capital programmes should consider improved sewer and drainage design capacity, development control to strongly address connection issues and funding or responsibilities needed to encourage uptake of innovative techniques such as SUDs;
- Re-evaluate resources and approaches for inspection and clearance of drain, culvert and gully blockages; and
- Ensure increased awareness of inter-dependencies between critical infrastructure, leading to improved resilience planning.

## Biodiversity

### *Key Impacts*

- There may be increased risk of fires on upland moorland as a result of hotter drier summers; and
- There is potential for an increase in wet habitat types such as heathland and grassland and associated species, although the net effect of changing rainfall patterns will depend on local conditions.

### *Key Adaptations*

- Wherever possible allow natural processes to continue, and therefore adaptation to change to occur naturally;
- Management of hazards and pressures. The management of fire risk already happens in areas of open access but there may need to be enhanced management of activities which could pose a hazard to species;
- An overall expansion in habitat types currently suffering from isolation or fragmentation, to improve habitat connectivity/permeability; 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*

- Declining mental and physical health due to increasing temperatures, and its associated impacts, particularly in existing areas of deprivation; and
- Growing incidence of respiratory illnesses due to an increasing number and intensity of air pollution episodes.

### *Key Adaptations*

- Urban design to minimise heat island effect as much as possible. New building designs, passive temperature control, renewable energy generation and use of green spaces; trees, parks, open spaces and green roofs;
- Raising awareness, educating and building community resilience to climate change and its likely impacts;
- Improvement in sustainable transport infrastructure to build resilience and reduce isolation and continued work to tackle social and economic inequalities.