


# YORKSHIRE AND HUMBER CLIMATE CHANGE ADAPTATION STUDY

## LOCAL AREA REPORT CALDERDALE DISTRICT

<p><b>Location</b></p>	
<p><b>Description of District</b></p>	<p>Calderdale District is a rural area located on the foothills of the Pennines in West Yorkshire.</p>
<p><b>Future Climate Projections</b></p>	<p>The results of the modelling carried out for the Yorkshire and Humber Climate Change Adaptation Study suggest that the following changes are likely by 2050:</p> <ul style="list-style-type: none"> <li>• The annual average temperature rising by 1.9°C;</li> <li>• The number of days classified as ‘hot’ (over 28°C) will increase by around 5 per year;</li> <li>• During the winter, average rainfall will increase by 15%; and</li> <li>• The number of frost days will fall by 43%.</li> </ul> <p>These figures relate to the nearest modelled cell, which was Leeds.</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 Calderdale 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 flood risk (fluvial, sewer/drainage, and from direct surface runoff) due to faster flows off the Pennines as the increasing seasonality of rainfall brings higher intensity, 'flashy' flows, particularly during the summer months;
- Increased flooding to infrastructure, businesses and housing; and
- Traffic impacts on main routes.

#### *Key Adaptations*

- Protect critical infrastructure and emergency services to ensure continuation of service, or relocate away from flood risk areas;
- Develop local flood management strategies to protect businesses and properties, or encourage flood-resilience of individual buildings where this is not viable; and
- Consider a wide range of flood reduction techniques, particularly across urban areas, to reduce impacts of surface water flooding.

### Business and Economy

#### *Key Impacts*

- There will be significant opportunities for the Advanced Manufacturing sector and the region's advanced technology industries in developing solutions to climate change challenges; 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*

- Increasing links with the regional and sub-regional universities will enable greater research and development. Combined with support from local and regional business organisations this will help make the most of the opportunities which will be presented; and

- 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 greater resilience of networks and transmission infrastructure.

## Public and Voluntary Services

### *Key Impacts*

- Secondary fires will see the largest proportional increase in incidents. Increased summer temperatures and drier soils could spark a noticeable increase in secondary, leading to primary, fires in the Pennines; and
- Coupled with this, there is expected to be increased strain on the health of individual fire-fighters and on the resources of rural Fire and Rescue Services.

### *Key Adaptations*

- Review resourcing and staffing in order to prepare adequately for future pressures; and
- Emergency planning will need well developed communication links with the Armed Forces Units to assist with resourcing when required.

## Infrastructure and Utilities

### *Key Impacts*

- Occasional reductions in the volume of water in individual reservoirs;
- Surface melt of rural road surfaces and associated knock-on effects, such as disruption to travel and welfare provision;
- Increased frequency of flooding from urban drainage and sewer systems in Halifax, especially in winter;
- Increased tourist and recreational pressure on the Peak District National Park, involving increased use of rural road networks through Calderdale for access;
- Increased blockage of drains, culverts and gullies from, for example, storm debris;
- Increased slippages in road or rail embankments or cuttings; 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;
- Allow additional resources for use of alternative road surfacing materials in carriageway maintenance programs to ensure higher melt resistance;

- Capital programs should consider improved sewer and drainage design capacity;
- Provide additional public transport to accommodate increased visitation to the Peak District National Park;
- Re-evaluate resources and approaches for inspection and clearance of drain, culvert and gulley blockages;
- Increased resources for inspection and maintenance of embankments and slopes; and
- Increase awareness of the critical inter-dependencies between infrastructures, leading to improved resilience planning.

## Biodiversity

### *Key Impacts*

- Changes in upland wetland will occur due to the impact of hotter drier summers and warmer wetter winters. As most blanket bog is on flatter moorland there could be more effect from drought resulting in greater fragmentation of habitats. Mobile species are likely to adapt, although other species may not; and
- There may be a loss of upland oak woodland as its climate space is predicted to move northward or to higher altitude. Tree loss may also be possible, especially in areas where they become waterlogged and are exposed to wind.

### *Key Adaptations*

- Wherever possible allow natural processes to continue, and therefore adaptation to occur naturally;
- Facilitate 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 as easily as possible; 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*

- Rising levels of respiratory complaints due to longer and more intense air pollution episodes as temperatures rise; and
- Declining mental and physical health due to stress induced by increasing temperatures, and its associated impacts, particularly in areas of deprivation.

*Key Adaptations*

- Revitalising urban design to minimise the heat island effect as much as possible; and
- Raising awareness, educating and building community resilience to climate change and its likely impacts (including support networks).