



# SCARBOROUGH BOROUGH COUNCIL CLIMATE CHANGE RISK ASSESSMENT



REPORT JANUARY 2011



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### EXECUTIVE SUMMARY

Amongst North Yorkshire Councils, Scarborough Borough faces some unique challenges from climate change as it faces the issue of sea level rise and coastal erosion. This also makes it more prone than many areas to any increased level of storms. Much of the Borough has a high elevation making it more at risk from the continued impacts of severe winters which are currently still a risk. The risk of flooding relates to rapid run-off from small rivers, streams and drains both in the winter and after intense summer rainfall events.

Many of these risks are well understood by Scarborough Borough Council (SBC) and its partners and the increased risk due to climate change is being factored into plans, particularly the Shoreline Management Plan. The Local Development Framework and other longer term plans also need to take account of climate change and policies are being developed in response.

There is projected to be more frequent warmer, drier summers and this provides risks to Council services but opportunities for the key tourism industry. The area tends to develop more self sufficient supply chains and this can be built on and exploited to become more resilient to a changing climate.

Many areas of SBC's services will be impacted by climate change and need to review their operational plans to ensure that the risks are taken into account. The lessons learnt and information need to be shared with key partners.

## **2. IDENTIFYING THE KEY RISKS TO SCARBOROUGH FROM A CHANGING CLIMATE**

### **2.1 Background**

In December 2010, DEFRA wrote to all Chief Executives of local authorities across England about adapting to climate change, for example changing rainfall patterns leading to flooding and droughts and an increase in the frequency of severe weather events. The letter highlighted that whilst central government performance monitoring through the National Indicators is set to end, the recent report of the independent Adaptation Sub Committee on climate change confirms that local authorities have an essential role to play in planning ahead and taking climate change adaptation action. The report highlights that in going forward with addressing the challenges of climate change, an immediate step that is required is to undertake local climate risk based assessments.

Climate risk evaluation assessment helps to determine the impacts of a changing climate on the business continuity of an organisation and highlights actions that can be undertaken to mitigate these impacts. The Director of Business Environment for the Confederation of Business Industry (CBI) notes, for example, that nationally, the flooding in 2007 had insurance claims totalling over £3 billion and, as our climate changes, it is estimated that annual flood damages alone could cost as much as £22bn by 2020<sup>1</sup>.

The sustainability officers group for York and North Yorkshire has drawn on Regional Improvement and Efficiency Partnership (RIEP) funding to employ two project offices to undertake climate risk assessment work in the local authorities of York and North Yorkshire.

### **2.2 Current Weather related risks to Scarborough**

The major risks to the Borough of Scarborough are often those that are already being seen from current weather conditions but which can be exacerbated by the changing climate. This work builds on the Local Impact Profile (LCLIP) that was carried out in 2010. This identified that the key current weather related impacts were excessive rainfall (39%) and snow and blizzards (34%). Storms and high winds were responsible for 20% of impacts, higher than for any other District Council in North Yorkshire. The key findings of the LCLIP were:-

- Scarborough Town suffered the most impacts of a single location.
- Coastal erosion is a significant event category and events are concentrated in rural areas.
- Flooding events have had the greatest impact on urban locations where drainage systems become overloaded.
- Beyond the involvement of emergency planning, the events have had the greatest consequences for highways, leisure and culture and schools.

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<sup>1</sup> The CBI has produced a report in September 2010 The CBI has produced a report in September 2010 called 'Whatever the weather: managing the risks from a changing climate'. This encourages businesses to undertake a climate based risk evaluation assessment covering areas such as supply chains, assets, operations, markets, regulatory compliance and business reputation.

- Of the services provided by the Borough, Leisure and Culture suffered the most impacts, followed by Environmental Health and refuse collection.

### 2.3 Assessing risks from a changing climate

To build on the LCLIP work it was considered that a more detailed climate change risk assessment was required which not only takes into consideration the key weather related impacts of the past 5 to 10 years but which focuses more specifically on impacts of weather changes in the present and a predicted changing climate in the future on the business continuity of service delivery by Scarborough Borough Council. The study sought to quantify these risks to key service delivery areas of the Council and identify where further collaborative work is needed in the Council and with partners. It also sought to identify where opportunities might arise that the Council and the wider Borough could seize to ensure that they work in their favour – these opportunities in turn can raise further risks – such as the potential for increased tourism to the Borough.

For Scarborough Borough Council, the work commenced in December 2010, with the major risks and suggested actions required to address these being assessed from interviews and discussions with Council staff across its key services. The discussions used the changes predicted by the UK Climate Projections 2009 (UKCP09) and the regional climate change study, see Table 1.

**Table 1. Predicted future climatic conditions in the Yorkshire and Humber**

Future Climatic condition	2020	2050	2080
Increased summer temperature	+ 1.3°C	+ 2.3°C	+ 3.3°C
Decreased summer rainfall	- 8%	- 19%	- 23%
Increased winter temperature	+ 1.3°C	+ 1.9°C	+ 2.9°C
Increased winter rainfall	+ 4%	+ 11%	+ 15%
Increased storminess	Increase overtime		
Increased rainfall intensity	Increase overtime		
Rising sea level	22cm by 2050, 36cm by 2080*		

Source: Weathering the storm: Yorkshire and Humber regional adaptation study, 2009

\* UKClimate Change Projections 2009 ([www.ukclimateprojections.defra.gov.uk](http://www.ukclimateprojections.defra.gov.uk))

The project officer used the comments on the likelihood and severity of the impact on their services and budget to rank the risk according to the methodology described. The risks are grouped by climatic risk and not by service as often different services are impacted and collaborative action is needed. In many cases now that the risk has been better identified further work is needed to provide a more geographical examination of the areas of the Borough at risk.

The risks and actions were those identified by those being interviewed or provided in Workshops and do not represent the views of the project officer. The detailed methodology used at the time can be seen at Appendix 1 below.

A further assessment is being made of services at the North Yorkshire County Council level, many of which services will also operate across the Borough of Scarborough. This assessment will be reviewed when the County wide assessment has been made. Further work

is being carried out by the North York Moors National Park which also needs to be taken into account.

This assessment has been made at a time of significant change and reorganisation in the provision of public services, the impact of which is not fully understood at the current time. As services change the risks and actions identified need to be passed on. It is hoped that risk assessment templates can be rolled out to LSP partners through a number of workshops so that businesses and voluntary organisations can draw upon them to assess climate risk within their organisations.

### 3. SUMMARY OF KEY RISKS AND ACTIONS NEEDED

RECEPTOR	FUTURE CLIMATIC CONDITION	IMPACT	CONSEQUENCE	Level	Of	Risk		ACTIONS	PARTNERS Needing to Work with SBC	Relative Cost
				NOW	2020	2040	2080			
Built environment	Sea level rise/ increased storms - made worse by increased wetting and drying cycle between winter and summer	Coastal erosion	Undermining of soft cliffs and erosion of coastline - destruction of housing and businesses	C3 (9)	C4 (12)	D4 (16)	E5 (25)	An actively managed existing risk. A detailed Shoreline Management Plan is in place which takes into account sea level rise. Funding provided via Defra and the Environment Agency to fund required engineering works.	Defra/ EA	£££ - from Defra /EA
Natural Environment		Coastal erosion	As above - loss of key coastal habitats - woodlands and wetlands	C3 (9)	C4 (12)	D4 (16)	E4 (20)	As above plus - need to review management of woodlands and vegetation along the coast to ensure adapted to conditions. High value habitats to be maintained in semi-natural conditions.	EA/ Forestry Commission/ NYMNP	££

Built Environment	Increased winter rainfall	Flooding from rivers and streams in winter	Damage to property	C4 (12)	C4 (12)	D4 (16)	E4 (20)	Flood management plans in place and protection being provided to many homes at risk. Further risk from new development needs to be taken into account in planning and building control.	Environment Agency/ NYMNP	££
Built Environment	Increased rainfall intensity after drier summer weather	Summer flash flooding due to run off	Damage to property	C4 (9)	D4 (16)	E4 (20)	E4 (20)	Management plans in place - clearing and management of current drains and gulleys taking place. In future major works to improve drainage system may be required.	Environment Agency	££/£££
Natural Environment	Increased storminess/ drier summers together with wetter winters	Adverse growing conditions	Loss of mature tree stocks	C3 (9)	C4 (12)	D4 (16)	D4 (16)	Major replanting of mature tree stock along roads and in parks and gardens to provide shade, using species that are better adapted to future climate	Forestry Commission/ Yorkshire Tree Officer Group	££
Natural Environment	Reduction in rainfall in the summer/hotter temperatures	Drought in vulnerable areas	Potential damage to natural and heritage assets, increased irrigation costs to farmers	C3 (9)	C4 (12)	D4 (16)	D4 (16)	Joint action with partners to manage available water and abstraction from vulnerable aquifer. Manage water demand from new developments	Yorkshire Water	££

Built Environment	Reduction in rainfall in the summer/hotter temperatures	Drought in vulnerable areas	Exhaustion of Corralian aquifer, Lack of water for properties,	C3 (12)	C4 (12)	D4 (16)	E4 (20)	Joint action with partners to manage available water and abstraction from vulnerable aquifer. Manage water demand from new developments	Yorkshire Water	££
Tourism and Business	Increased summer temperature, increased winter temperature, decreased summer rainfall	Longer tourist season	Increased number of tourists, greater use of outdoor venues	1	4	9	16	Promote 'café culture' of outdoor eating and entertainment including more outdoor major events, supported by better prediction of adverse conditions, greater use of outdoor venues, ensure that drinking water and shade are available	Tourism Industry	£

### KEY

The risks are quantified using the methodology followed, with likelihood being multiplied by severity. They are described using the Scarborough Borough Council risk methodology as well as that used generally in the project. The colour blue in varying shades has been used for opportunities.

The actions identified are those: under way or planned in green; medium term over the next 5 years in amber; those needed over the next 5 to 10 years and beyond in red. Where actions are needed by partners other than Scarborough Borough Council they are named. NYMNP is the North York Moors National Park and EA is the Environment Agency.

A relative cost has also been given, £ is low, ££ medium and £££ high, these are relative to the Departments budget and are not quantified at this stage. Where there are different costs in the short, medium and long term they are marked in same colours as the actions.



## 4 SERVICE AREA ACTIONS AND RISKS

### 4.1 COASTAL EROSION AND FLOODING

#### 4.1.1 Coastal Erosion and Coastal Flooding

The coast of Scarborough Borough is already at risk from coastal erosion as it is formed of boulder clay which has many fissures and cracks. Impacts on the coast are intensely monitored using wave buoys, frequent aerial surveys and examination of rainfall data. Climate change is predicted to make erosion worse due to rising seas level, increased storminess and because of more soil subsidence caused by the more extreme wetting and drying cycle.

The existing mechanism which identifies action needed to combat coastal erosion is the development of a Shoreline Management Plan, these are used to prioritise Defra and Environment Agency funding for coastal protection and retreat. The current Round of these plans fully takes in to account the climate change scenarios going forward so that this will be taken into account during decision making, particularly on the funding for new or strengthened sea defences. There are areas of the coast which are important habitats where it will be necessary to amend management practices rather than build hard defences.

**ACTIONS:** Scarborough Council to continue to work with partners to develop the Shoreline Management Plan and seek funds to implement from Defra. Associated risks are shared with organisations and businesses so that they can make their own risk assessment.

In some areas there may need to be a 'roll-back' policy, like that introduced in the East Riding so that businesses can plan to retreat ahead of an eroding coast allowing affected businesses to move inland.

#### 4.1.2 On-land Flooding

Due to the nature of the terrain the major risks are associated with smaller rivers and streams running more rapidly from high ground. The flooding is usually pluvial as it is the over coming the capacity of drains that causes the problem, rather than overtopping main river storage capacity. This can happen in the winter or from high intensity rainfall in the summer, as at Filey in 2007.

**ACTIONS:** Actions are already underway to maintain drains to prevent blockages causing problems and to install temporary flood protection measures for properties.

In the future there may need to be large scale investment in improved drainage to increase capacity to deal with the levels of water that are expected.

## 4.2 PLANNING

The Planning team are currently producing a new Local Development Framework to replace the existing Borough Plan from 1999. The LDF is a long term document, to

2026, so adapting to a changing climate needs to be considered. The plan is trying to take an overall approach to dealing with development in the District as it is difficult to address issues when considering individual applications for development. There are a number of future climate risks that need to be taken into account.

The Core Strategy considers that strategic flood defence is one of the key risks and the forward modelling on this takes into account climate change. Developers also need to be encouraged to include sustainable drainage systems into their plans for developments. There is an active North Yorkshire Flood Management Group which can help develop an overview across North Yorkshire of the issues.

The impact of coastal erosion needs to be included with policies to allow tourist and other businesses to move back from areas at risk. The Shore Line Management Plan described above takes climate change into account and needs to be aligned with the planning process.

There are also concerns over availability of water with hotter, drier summers as Scarborough's water is provided by ground water from the Corralian Aquifer. Planning policies must ensure that availability of water is considered. Follow up discussions with Yorkshire Water are needed to examine future water availability in the Borough and across North Yorkshire.

### **Transport**

Local transport planning in Scarborough Borough is important as it has a more self contained general economy than most other areas in the Region, with many people living and working in the Borough. The development that is taking place needs to help build on sustainable means of transport and work is needed to increase local bus use and other forms such as cycling. Future development needs to consider other methods such as the ability to plug-in electric vehicles. Developing more sustainable transport helps combat further climate change, however, as these methods are developed their resilience to climate change would in turn need to be considered.

Housing – see Housing 4.7

**ACTIONS:** Development of the LDF, transport plans and other planning documents and the decisions made on applications need to take into account the greater risk from many conditions due to climate change.

Better evidence for the LDF is available on some issues and needs to be provided. Support for increasing awareness of these issues for planners and members is available via the Climate Change Skills Fund.

### 4.4 **HEALTH AND SAFETY**

Health and safety is mostly a consideration of operational issues and risks are assessed on an on-going basis to ensure they are managed correctly. This means providing the training required and the necessary protective equipment. As climate change impacts on conditions then the training and equipment needs to be reviewed.

Many impacts are considered currently but the extent of these may change. If there are increasingly hot and dry conditions then sun block and shading at work would need to be considered. As these risks increased there would need to be a review of working practices, potentially with more work at the beginning and end of the day with a siesta in between.

If a changing climate led to a different range of pests and diseases being introduced, the methods for cleansing and disinfection would need to be reviewed to ensure that they were fit for purpose.

Much of H&S guidance arises from HSE nationally, Defra need to engage with HSE to ensure that this takes into account a changing climate.

**ACTION:** Regular review of H&S advice nationally and locally, including on new pests and diseases, to ensure that changing conditions are considered.

#### 4.5 **PARKS, GARDENS AND NATURAL ENVIRONMENT**

The Borough of Scarborough has a diverse and valuable natural environment, from coastal areas, managed parks and gardens, and low lying flood meadows together with moorland and forest areas designated as National Park.

##### 4.5.1 Parks and Gardens

Scarborough Borough Council are responsible for a number of high quality parks, semi-natural areas and trees. In managed areas the species being planted needs to be kept under review so that species more resilient to wetter winters and hotter drier summer conditions can be planted. The vegetation also be impacted by salt laden winds and storms. Trees are particularly at risk from storms, especially North Westerly winds. The Borough has a number of high value Mature Evergreen Oaks which can be affected by freezing conditions and winds. A campaign is needed with planting of trees for future conditions, this can be linked to Central Government's Big Plant' programme which was launched in December 2010 <sup>2</sup>.

The changing climate is changing the growing season of some plants, including grass growing on managed areas. This is increasing the costs of management as it is over a longer period of the year. It is considered that this can be dealt with by an examination and revision of management standards so that management, such as grass cutting, can be dealt with when required with management potentially reduced in periods of less growth, such as warmer, drier summers.

##### **ACTIONS:**

Sub-regionally examine evidence on climate change impacts on trees and use to plan restocking of planted trees more resilient to the conditions.

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<sup>2</sup> <http://thebigtreeplant.direct.gov.uk/funding>

Expert to talk to the tree officers group of North Yorkshire local authorities about climate change and need to think about tree species and a tree stock suitable for the changing climate.

General management of parks and green spaces, such as grass cutting and the species being grown to be reviewed as climate changes. Need to ensure that practises cover conditions at that time and those predicted

#### 4.5.2 Natural Environment

The Borough has many important natural areas, some of these fall within the National Park area so are not directly considered in this report. The coastal areas are examined in the Shoreline Management Plan where projected changes in climate are built in. There are some important coastal wooded areas which are on boulder clay which could be more greatly affected by wetting and drying cycles in the future and storm events on the coast. Management needs to take into account these areas and woodland protected or space made for retreat from the coastline.

There are specific pressures on important habitats in the Vale of Pickering as described in the Case Study below. In general, there is a risk as habitats are lost that species become fragmented and cannot move as conditions change. Wider landscape changes need to be considered, with linkages provided along corridors to other suitable areas.

**ACTIONS:** Protection of important semi-native woodland needs to be considered along with other issues in the Shoreline Management Plans.

Work with other areas needs to take place on a landscape scale to consider the dispersion and movement of species during changing climatic conditions.

## 4.6 ASSET MANAGEMENT, including IT

### 4.6.1 Asset Management

There are a number of assets of Scarborough Borough Council which are at varying levels of risk from climate change. An assessment needs to be made of key risks, including those raised in this report, and these need to be captured on the Corporate Risk Register.

Key risks identified include that following reorganisation of highways maintenance the Borough Council will retain ownership of the beach and key sea-front access routes. The responsible departments need to liaise with 'major project' team to ensure these are protected as part of the Shoreline Management Plan or to ensure other management options is planned.

The Council own many historic and listed buildings. These are not easily adaptable to warmer conditions and the installation of sustainable cooling systems. There needs to be joint work with York, which faces similar issues, to examine the best way to

manage heritage buildings during a changing climate, support is available through a RIEP supported project.

**ACTION:** Scarborough Borough Council assets to be examined for risks to a changing climate and major risks identified in the corporate risk register.

#### 4.6.2 Procurement

Some major procurement issues are included in decision made on major projects to deal with issues such as flooding. Across procurement in the Council the risk from climate change needs to be considered, for example in equipping buildings for hotter weather as well as cold conditions. North Yorkshire County Council have a procurement policy that takes into account a changing climate may be useful for use in Scarborough.

**ACTION:** Procurement policies to take into account climate change risks identified, the North Yorkshire CC policy may be a useful model to examine.

#### 4.6.1 IT

There is a risk to the Council and other partners IT assets if they were to over heat in very hot conditions. As many telecommunications systems are connected to IT links this brings further risk of disruption to Council business. The extra energy demand for cooling needs to be considered for future buildings, or different ways of housing IT equipment developed so that it is not grouped together thus creating a greater problem. This may need extra investments at difficult times, but must be considered on any building redesign.

The risk to IT systems from floods and storms is now better understood and most facilities are placed in more secure locations, for example, not in building basements. This needs to be considered with future increasing risk.

Individual work stations are generally robust as they are housed individually. Increased flexibility to work from home helps during disruptions to transport, this may require a full range of customer services to be linked to home working but would give extra flexibility

**ACTION:** Ensure that cooled areas available for IT or a different strategy of management of IT systems is developed. Home working systems supported to provide more resilience during transport disruptions.

## 4.7 HOUSING

There are a number of risks to housing and other buildings. Damage from flooding and coastal change are described at 4.1 and 4.2 above.

A further risk to those occupying buildings is the potential for much hotter and drier conditions and the ability to provide cooler conditions in houses. New houses are covered by the Code for Sustainable homes but this comes into force more slowly for private housing. There have also been concerns about the ability for cooling to be delivered effectively at the higher standards of the Code. This may slow the implementation of sustainable standards in the sub-region.

Previously standards had been set nationally for social housing that could build into account the need for improved ability to withstand changing conditions. In the new approach of localism it is likely that each area will need to agree the standards that will apply. These will be needed to protect the vulnerable groups that live in social housing such as elderly.

**ACTION:** Standards for new development and retrofitting homes needs to build into account risks from climate change, including increased temperatures.

There needs to be better information about the actions needed to deal with climate change, for example for properties susceptible to flooding, putting electricity sockets higher up the wall, keeping valuable documents upstairs, having adequate insurance, waterproof plaster and providing living space upstairs.

## 4.8 EMERGENCY PLANNING

The responsibility for Emergency Planning is shared with North Yorkshire County Council with specific liaison officers in place. There are well embedded and rehearsed plans in place for key risks, such as flooding and excess heat. There were severe impacts from pluvial flooding in Filey so a localised approach involving to the Town Council is being developed to deal with this issue. A risk going forward is that there are a number of institutional changes going on the current time with changing roles, including to local authority and health organisations. It is important that relationships are maintained and roles made clear during this changing period.

In recent winters a number of threats have appeared from sudden spells of very cold weather and snow. Although climate change predictions suggest that over a period of time this type of impact should diminish there could still be periods of variable weather for some time. There is not currently a County-wide plan in place to deal with severe weather and this could be developed with extreme winter weather being included.

Much of Scarborough Borough is rural with some difficult to reach communities in case of weather related impacts. North Yorkshire is working on greater community led-resilience, to support that help communities often provide themselves when there are problems. This means working more with Town and Parish Councils and other groups. This is an approach which would be helpful to develop across the Borough to

deal with a range of impacts. Co-ordination from the Town Hall needs to be sufficient to deal with the range of emergencies that will be seen over time.

**ACTIONS:** Multi-agency working on resilience needs to be retained in the face of organisational change

General severe weather plan to be put in place to deal with a range of potential impacts

Community resilience to be developed across the Borough with sufficient central co-ordination capability retained.

#### **4.9 ENVIRONMENTAL HEALTH**

This service faces similar challenges to Health and Safety but works with organisations outside the Council in terms of licensing their premises and providing advice on public health. Potentially pests and diseases may change so it would need to provide advice on whether current advice and standards of public health are sufficient or whether further advice would be required. There would need to be updated advice on protection of the public during hot conditions and ensuring a supply of drinking water, in liaison with Yorkshire Water

**ACTION:** Regularly review standards and advice in light of a changing climate.

#### **4.10 TOURISM**

A changing climate brings benefits and threats to tourism in the Borough of Scarborough. These include warmer, drier summers that could support more outdoor activities and a warmer winter allowing an extended season. This could allow increasing range of outdoor events over a longer period. The Borough would need to develop plans to further market itself to visitors in these circumstances. There could be an increase in the camping and caravanning season.

These developments also come with risks. In much warmer summers there would need to be cooling and shade provided at venues and consideration of alternative venues if increased storminess and high intensity rainfall took place at the time events were planned.

The Borough has already been trying to seize the opportunities to hold further outdoor events on a longer season. It already has a major cricket festival and a new outdoor theatre and is developing other events. As stated previously some of these events have been cancelled or affected by bad weather on the day. Event Planning needs to build in this eventuality and better forecasting of shorter term weather patterns would be an advantage, so that alternative plans could be brought into play.

Another key issue for Scarborough Tourism are the Bathing Beaches in the District. It is important that these meet the needs of the EU Bathing Water Directive. Major

works are under way in the Borough, with joint working between Yorkshire Water, Environment Agency and Defra. These seek to prevent run of water in event of a storms polluting beaches. It is important that the improved facilities planned take into account the predicted increasing winter rainfall and more high intensity events.

**ACTION:** Tourism and Leisure to seek to use possibility of longer tourist season, explore ways of building in continuity plans in event of storm event.

Work with Yorkshire Water to ensure plans to improve quality of bathing water build in sufficient capacity to deal with predicted future weather events. The beaches themselves need to be protected in the Shoreline Management Plans as they are key assets.

#### 4.11 ECONOMIC DEVELOPMENT

There are a number of threats to businesses in Scarborough but also potential benefits from adapting to climate change and the low carbon approach needed to deal with climate change. Weather impacts can threaten premises and travel to work as described under Built Environment and transport above (see 4.7) but can also impact on supply chains of raw materials and sale of goods produced. Scarborough has local economy so shorter movement of work force and some supplies. Business is relying on others to maintain infrastructure during adverse conditions but it is important that businesses consider their own continuity plans taking into account the changing conditions in the UK and elsewhere. Increased home working could support a more flexible approach and resilient IT and telecoms is needed.

There are also opportunities from climate change with the possibility of large scale installation of wind turbines that Scarborough industry can benefit from. In turn plans must be in place to support this industry during a changing climate. There is consideration that the extra sea defences needed to protect the coast could have wave power generation built into the scheme. Further renewable energy could provide resilience when there is pressure on energy supplies.

There are plans and developments to enable businesses to develop in the Borough, such as industrial parks. These can help seize opportunities for green infrastructure and low carbon development with companies sharing technology and resources, such as combined heat and power. They must be well planned to avoid further stress on vulnerable aquifers and alternatively making run off during intense rainfall worse.

**ACTION:** Support needs to be provided to local businesses to examine their current vulnerability and build adaptive response. The opportunity is also needed to maximise the potential for benefits.

Future infrastructure must be resilient to a future climate and so as to avoid creating additional impacts. For example, offshore and on-shore wind power generation needs to be resilient to storms



#### 4.10 WASTE AND LOCAL ENVIRONMENTAL QUALITY

It was felt that despite being a number of risks to services that these should be overcome with improved contingency plans as the climate changes rather than major changes taking place at present. There Council operates alternate weekly collection system and it was considered that within the changes likely to be seen that major problems with waste left for two weeks were unlikely to develop.

There can be extra demands on the service with potential increases and cleaning up after storms. Some services are being out sourced so that flexibility needs to be retained in contracts to be able to respond to these issues.

There are specific issues with one waste disposal plant, the Seamer Carr Pyrolysis plant where problems from greater amount of odour and dust can occur in drier conditions. Further consideration is need on how to prevent further problems with future hotter, drier weather.

The main issue can be disruption to transport links as this would cause problems with workers accessing vehicles and in travelling across the District. There could also be problems with waste disposal as residual waste needs to be delivered to a joint facility, potentially near Harrogate.

<p><b>ACTION:</b> Improved business continuity plans need to be put in place as climate change increases risks the risks seen in certain conditions across the year.</p>
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#### **SOCIAL CARE**

Considered at North Yorkshire County Level.

## CASE STUDY – FLIXTON CARR AND THE VALE OF PICKERING



This area captures many of the varying pressures faced by this part of North Yorkshire, which already exist but which will be exacerbated by a changing climate. The area contains very important archaeological remains and the land is being managed to improve its value to wildlife. However, the area relies on farmers actively managing the land to make a profit from crops and livestock as well as favouring wildlife, this is supported by High Level Stewardship agreements with Natural England.

The development and continuity of this system depends on the ready availability of water supplies, to maintain summer water levels to preserve archaeology, develop wetland habitats and provide irrigation water for high value crops such as potatoes. However, Climate change is predicted to reduce summer rainfall by up to 19 % by 2050. There is a key aquifer at risk, the Corralian aquifer which supplies water to another users and which is already at threat from over extraction during dry times.

There are housing developments proposed for south Scarborough could affect the water flows into the Vale. Plans need to ensure that housing does not contribute to run off events with high rainfall at unseasonable times of the year and also to ensure that development do not prevent recharge of the aquifer.

Irrigation waters used in the Vale may cause problem with deposits in the soil which may affect natural systems and crops. This may become worse if a greater level of irrigation is needed in the future.

The key to action is partnership working to bring the range of organisation involved together to understand the issues being faced and by how much climate change might make conditions worse. Once the issues are better understood a joint plan can be developed. It is possible that lessons can be learnt from similar lowland peat areas in South Yorkshire – at the Hatfield and Thorne Moors where a landscape scale study has been led by Natural England to examine maximising the peat bog to deal with a prevent further climate change.

## 5. CONCLUSIONS

Following table details the work that now needs to be carried out across Scarborough Borough Council's various departments in order to ensure York prepares and adapts to a changing climate.

Identified Risk	Identified Action and Reference to Report Section	Lead Department	Add to service/ departmental plans Now 2020 2040 2080	Add to SBC Risk Register Now 2020 2040 2080
Coastal erosion and flood risk	Scarborough Council to continue to work with partners to develop Shoreline Management Plan and seek funds to implement from Defra. Associated risks are shared with organisations and businesses so that they can make their own risk assessment.	Technical Services	Now	Now
	Protection and management of key natural coastal habitats and species needs to be considered	Countryside Services	Now	Now
Coastal erosion and flood risk	In some areas there may need to be a 'roll-back' policy, like that introduced in the East Riding so that businesses can plan to retreat ahead of an eroding coast allowing affected businesses to move inland.	Planning Team	Now	Now
Flooding from rivers, drains and streams – due to increased winter rain or	.Actions are already underway to maintain drains to prevent blockages causing problems and to install temporary flood protection measures for properties.	Technical services	Now	Now

increased intensity at any time	In the future there may need to be large scale investment in improved drainage to increase capacity to deal with the levels of water that are expected			
Increased summer temperatures and decreased rainfall	4.6.1 Ensure that cooled areas available for IT or a different strategy of management of IT systems is developed	IT	Now	2020
Increased summer temperatures and decreased rainfall	4.6 Tourism Industry to develop plans and actions to provide further outdoor events and facilities. Ensure shade and prevent dehydration if very hot – build in business continuity plans in event of storms	Tourism	Now	2020
Range of climatic conditions affecting planning and policies	4.2 Development of the LDF, transport plans and other planning documents and the decisions made on applications need to take into account the greater risk from many conditions due to climate change.  Better evidence for the LDF is available on some issues and needs to be provided. Support for increasing awareness of these issues for planners and members is available via the Climate Change Skills Fund	Planning		
Range of climatic conditions affecting planning and policies – linked to service delivery	4.7 Standards for new development and retrofitting homes needs to build into account risks from climate change, including increased temperatures.  There needs to be better information about the actions needed, for example, putting electricity sockets higher up the wall so that they are not affected by flooding, education of residents so that valuable documents are kept upstairs, have adequate insurance, waterproof	Housing	Now	2020

	plaster and living space upstairs for those homes susceptible to predicted flooding.			
Range of climatic conditions affecting service delivery	<p>4.5.1 Sub-regionally examine evidence on climate change impacts on trees and use to plan restocking of planted trees more resilient to the conditions.</p> <p>General management of parks and green spaces, such as grass cutting and the species being grown be reviewed as climate changes. Need to ensure that practises cover conditions at that time and those predicted</p>	Park and Gardens	Now	2020
Range of climatic conditions affecting service delivery	4.4 Regular review of H&S advice nationally and locally to ensure that changing conditions, including new pests and diseases are considered	Health and safety	Now	2020
Range of climatic conditions affecting service delivery	4.5 Work with other areas needs to take place on a landscape scale to consider the dispersion and movement of species during changing climatic conditions	Countryside Services	Now	2020
Range of climatic conditions affecting service delivery, particularly warmer drier summers	<p>4.6.1 Scarborough Borough Council assets to be examined for risks to a changing climate and major risks identified in the corporate risk register</p> <p>4.6.2 Procurement policies to take into account climate change risks identified, the North Yorkshire CC policy may be a useful model to examine</p>	Asset Management and procurement	2020	2030
Range of climatic conditions affecting service delivery	4.8 Multi-agency working on resilience needs to be retained in the face of organisational change	Emergency Planning	Now	Now

	<p>General severe weather plan to be put in place to deal with a range of potential impacts</p> <p>Community resilience to be developed across the Borough with sufficient central co-ordination capability retained.</p>			
Range of climatic conditions affecting service delivery	4.9 Regularly review standards and advice in light of a changing climate	Environmental Health	Now	2020
Range of climatic conditions affecting service delivery	4.10 Improved business continuity plans need to be put in place as climate change increases risks the risks seen in certain conditions across the year.	Waste	Now	Now
Range of climatic conditions affecting service delivery	<p>4.1.1 Support needs to be provided to local businesses to examine their current vulnerability and build adaptive response. The opportunity is also needed to maximise the potential for benefits.</p> <p>Future infrastructure must be resilient to a future climate and so as to avoid creating additional impacts. For example, offshore and on-shore wind power generation needs to be resilient to storms</p>	Economic Development	Now	2020

## **KEY ACTIONS TO TAKE FORWARD WITH PARTNERS**

Set up a meeting with Environment Agency Regional Flood Risk Team to discuss available data to feed into LDF, LTP and other plans to address flood risk

Work with Yorkshire Water to ensure plans to improve quality of bathing water build in sufficient capacity to deal with predicted future weather events. The beaches themselves need to be protected in the Shoreline Management Plans as they are key assets.

Work with businesses and Business Groups to examine their business opportunities and risks under a changing climate, potentially using the UK Climate Impacts Programme Business Area Climate Impact Assessment Tool (BACLIAT) methodology.

Actions needed across North Yorkshire that the Climate Change Risk Assessment Project could facilitate:

- examine water availability with Yorkshire Water in light of a changing climate
- discuss risks to rail links with Network Rail
- provide information from Forestry Commission on managing trees in a changing climate and share, expert to talk to Yorkshire Tree Officer Group

**METHODOLOGY – SCARBOROUGH BC CLIMATE CHANGE RISK  
ASSESSMENT AND ACTION PLANNING 2010**

**1. Key activities at risk:**

Consider the key activities that your service/work area currently have responsibility for and consider the major impacts that a changing climate might have on your work. A matrix has already been partly completed by pulling out actions from a similar exercise in West Yorkshire and the assessment builds on Scarborough’s Local Climate Impact Profile carried out 2010.

**2. Future climatic conditions affecting activities:**

Please use the menu below to select the individual climatic condition relevant to the chosen activity. The table below outline these future climatic conditions:

<b>Future Climatic condition</b>	<b>2020</b>	<b>2050</b>	<b>2080</b>
Increased summer temperature	+ 1.3°C	+ 2.3°C	+ 3.3°C
Decreased summer rainfall	- 8%	- 19%	- 23%
Increased winter temperature	+ 1.3°C	+ 1.9°C	+ 2.9°C
Increased winter rainfall	+ 4%	+ 11%	+ 15%
Increased storminess	Increase overtime		
Increased rainfall intensity	Increase overtime		
Rising sea level	22cm by 2050, 36cm by 2080*		

Source: **Weathering the storm: Yorkshire and Humber regional adaptation study, 2009**

\* UKClimate Change Projections 2009

**3. Impact:**

Please list the key impacts that the different climatic conditions (above) would have on the activities e.g. flooding or heatwave.

**4. Consequence:**

What are the results of the impacts? Who or what is impacted? Please list positive & negative consequences e.g.: Increased tourism (+) or road closed (-). If the consequence is positive, then highlight in blue.

**5. How severe is the impact:**

Please rank using the following scores:

- 1 = Low
- 2 = Minor
- 3 = Medium
- 4 = Major
- 5 = Disaster

**6. How likely is the risk:**

Please rank using the following scores:

- 1 = Very Low
- 2 = Not Likely
- 3 = Likely
- 4 = Very Likely
- 5 = Almost Certain



## **7. Actions to address high risk areas.**

Multiply severity by likelihood to give an overall score – a score of 16 and above is considered a red risk.

**Taking each red risk -** Please list any actions that are currently in place or will soon be out in place to address the risk. If there are none, please propose what would be necessary to deal with the risk. Each action should be colour-coded to represent whether the action is needed, planned or done.

Red = needed

Amber = planned

Green = done

## **8. Cost of action:**

Score low, medium or high. Monetary values were not used as the cost will be relative to each service or sector & should not be used as a comparable measure.

## **SCARBOROUGH RISK ASSESSMENT METHODOLOGY**

Quantification of risks in the document above uses the SBC Methodology – this is similar but rates Likelihood as A to E and Impact as 1 -5 using similar levels in the 5 point scale. A greater number of risks are rated as red – see below.

JAMES TO ADD?

**APPENDIX 2. OFFICERS INTERVIEWED DURING THE CCRA**  
**APPENDIX 2. List of Officers Interviewed**

<b>Name</b>	<b>Service/unit</b>
Phil Yardley	Tree Officer
Roger Burnett	Parks and countryside
Chris Bourne Stewart Rowe	Technical services - Project management - Flooding - Coastal erosion
David Gomersall	Procurement
Steve Pogson	Environmental Health
Bob Webster Robert Sunley	Health and Safety Emergency Planning
Steve Reynolds Paul Thompson Kevin Scholey Harry Briggs	Environmental Service: - waste management/street cleansing - fleet transport - recycling and waste enforcement
Andrew Rowe	Housing Manager
David Kelly	Economic Development
Martin Pedley	Risk management
Jonathan Leyroyd	IT Manager
David Walker	Forward Planning Manager Development Management Manager
Jill Lowe	Major projects officer
Hugh Smith	Urban Area Planning Manager
Marcus Whitmore	Area Planning Manager
Nick Read	
Andrew Williams	Leisure Manager
Janet Deacon	Tourism Manager