



Local Climate Impact Profile



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Introduction

2. Climate Change is often split between mitigation and adaptation. Mitigation is what is being done to mitigate or reduce green house gases, which can include recycling, energy efficiency and reducing the use of finite resources. Climate Change Adaptation is where it is acknowledged that regardless of some mitigation measures, climate change is still likely to happen and we need to prepare and adapt to that changing climate. At present most of Aberdeenshire Council's Climate Change work has focused primarily on mitigation through the Climate Change Action Plan.

2.1 Climate Change Adaptation



Fig 1: © SCCIP 2009.

- 2.2 The Intergovernmental Panel on Climate Change (IPCC) definition of Climate Change Adaptation is "The IPCC defines adaptation as having three possible objectives: to reduce exposure to the risk of damage; to develop the capacity to cope with unavoidable damages; and to take advantage of new opportunities. Adaptation can be 'autonomous' or 'spontaneous', in that the response is unplanned and happens unconsciously; 'planned', in that adaptation is the result of a deliberate policy decision, (based on an awareness that conditions have or are about to change); or 'anticipatory' (proactive), in that adaptation takes place before impacts are observed."¹

¹ Adapting Institutions to Climate Change Summary Report (2010), Royal Commission on Environmental Pollution.

Local Climate Impact Profile

- 3.1 A Local Climate Impact Profile (LCLIP) is a report highlighting the issue of climate change adaptation and how extreme weather events have affected Aberdeenshire in the recent past and currently. It is primarily a communication tool to raise awareness of Climate Change Adaptation and is not meant to be a comprehensive scientific study.
- 3.2 The current predictions for Climate Change indicate that the amount of extreme weather is likely to increase in the future. This LCLIP highlights what extreme weather has happened in the recent past and the impact and consequences of the weather. This should help the Council to be aware of instances in the past and focus on being better prepared and adapt to a likely increase in extreme weather events.
- 3.3 Once completed this report will be circulated and consulted on internally to officers and elected members of Aberdeenshire Council. It is hoped that the LCLIP will be used as a 'baseline' on the current situation of climate change adaptation and give recommendations on how the Council could better focus its services to be more resilient to Climate Change, help form the basis of a Climate Change Adaptation Strategy and raise awareness of Climate Change Adaption.



Aberdeenshire Context

- 4.1 Aberdeenshire Council is a local authority in the North East of Scotland. The Council's headquarters is in Woodhill House, Aberdeen. The Council employs around 14,500 people across several hundred locations, including schools, parks and offices.
- 4.2 Aberdeenshire is a rural area which extends to 6,313 sq km (2,437 square miles), representing 8% of Scotland's overall territory. The landscape varies from the mountainous Cairngorms through agricultural lowlands to coastline. Based on Aberdeenshire Council's Small Area Population Estimates and Forecasts (2007 Update), the population of Aberdeenshire represents 4.6% of Scotland's total, standing at 236,260 (2006)².
- 4.3 Aberdeenshire Council along with the other 31 local authorities in Scotland has signed up to Scotland's Climate Change Declaration; it also has a Sustainability Charter which outlines its principles of sustainability, namely:
- 4.3.1 Responsible use of natural, built and community resources We will minimise the use of non-renewable resources like fossil fuels, and use renewable energies within their limits through responsible energy management to reduce waste. All resources will be used as efficiently as possible.
- 4.3.2 The need to care for both present and future generations We will ensure that long-term and global impacts like greenhouse gases and loss of species have greater weighting than short-term, local effects. Where there is a potential threat to the environment or to communities, the precautionary principle will apply.
- 4.3.3 Achieving a Sustainable Aberdeenshire The council will support policies to promote social cohesion and a sustainable economy, operating within environmental limits.
- 4.3.4 Evidence Based Decision Making In accordance with the principles of good governance, we will use sound science to inform our actions, while our decisions making process will be evidence based.
- 4.4 Aberdeenshire Council's Scrutiny and Audit committee conducted an audit on the Council's response to Climate Change; the findings of this are available in a document called 'The Bigger Issue'. The findings from this report state that "Aberdeenshire Council would seek to be a carbon neutral organisation in the short to medium term, i.e. by 2020, and for the whole area of Aberdeenshire to be carbon neutral in the medium to long term, i.e. by 2030".
- 4.5 Aberdeenshire Council internally has a Sustainability Officers Group and Sustainability Sub-Committee which monitors and implements Sustainability. Aberdeenshire Council is involved in several other groups which have sustainability and climate change in their remit such as the North East Scotland Climate Change Partnership, Aberdeenshire Community Planning Partnership and North East Scotland Flood Liaison Advisory Group, as well as other joint working with our partners across all services and is part of the Grampian Emergency Planning Unit.

² Aberdeenshire Statistics, Aberdeenshire Profile, April 2009.

- 4.6 Many of Aberdeenshire Council's existing plans and strategies already include information and actions of relevance to climate change adaptation. The proposed Local Development Plan and draft Shoreline Management Plan are two examples of this. Moving forward it will be important to identify how a wide range of plans and strategies already do, or should in the future, include information and actions of relevance to climate change adaptation.
- 4.7 Nationally building standards were amended in October 2010 which include more emphasis on energy efficiency and should help improve the resilience of buildings to changes in climate and the challenges that this will bring.
- 4.8 Scotland has also passed The Climate Change (Scotland) Act 2009 which set national targets for carbon emissions reduction of at least 42% by 2020 and at least 80% by 2050, against a baseline of 1990.
- 4.9 Aberdeenshire Council as a public body will have duties under the Act to help ensure that these targets are met. These duties are likely to be confirmed and come into force early in 2011.



Methodology

- 5.1 The work was carried out using the guidance document provided by SCCIP and from the SCCIP staff and the LCLIP workshops.
- 5.2 The research stage of the project involved using a range of media sources to identify severe weather events that affected Aberdeenshire, as well as the impact, consequences and response to the events.
- 5.3 A student from the Business Environment Partnership (BEP) was employed for a six week work placement to carry out the initial data collection, media trawl and interviews.
- 5.4 The media trawl was carried out using online resources such as news websites and newspapers on microfiche in local libraries.
- 5.5 The data collected from the media trawl was collated in the Microsoft excel spreadsheet which was provided by the SCCIP. This spreadsheet was amended slightly to suit the needs of Aberdeenshire Council.
- 5.6 The media review is used to gain an overview of the range and type of weather events that have affected the area and identify basic impacts and consequences.
- 5.7 Interviews were carried out with members of staff internally within the Council as well as interviews with wider community partners for their views of the impact and consequences of extreme weather. Several other organisations/ services both internally and externally from our partners provided data and anecdotal evidence. The interviews were used to discuss more detailed information about how individual services, organisations or areas were impacted.
- 5.8 During the time, that the LCLIP was being prepared there were instances of flooding in Aberdeenshire, as well as a particularly bad winter which put a strain on public services and infrastructure as well as having severe consequences for many people. As a result of this, it was decided that as part of the LCLIP, there would be a case study on the flooding in Stonehaven November 2009. Information for this case study has been taken from newspaper articles, Council Committee reports and information from staff and partners.

Aim of the LCLIP

The aim of this Local Climate Impact profile is to raise awareness of the topic of climate change adaptation, by looking at the recent past of extreme weather events in Aberdeenshire.

Objectives of the LCLIP

6.1.1 Carry out the research stage of the LCLIP for the Aberdeenshire Council area. The LCLIP aims to identify severe weather events that have affected Aberdeenshire and the impacts consequences and responses to the severe weather events,

6.1.2 Follow the guidance on LCLIP's that was produced by SCCIP and SNIFFER which was based on Best Practice as a result of four Scottish Local authorities which took part in a pilot for LCLIP's,

6.1.3 Collate and log information, using media sources and information held by Aberdeenshire Council and partner organisations, through records and interviews with staff,

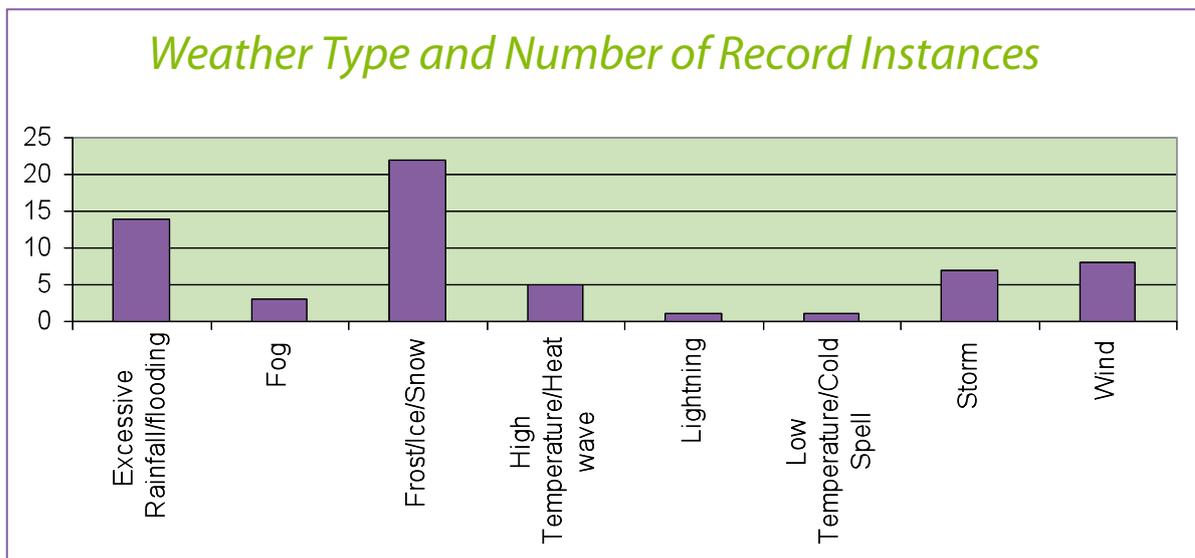
6.1.4 Analyse and check accuracy of the information collected,

6.1.5 Make any recommendations that could help improve Aberdeenshire Council's resilience and response to severe weather events.



Findings from the Media Search

- 7.1 The purpose of the media search was to see what weather events were recorded by the media and what the events effected and were the consequences. Around 65 extreme weather events were recorded in local media from 2000 to November 2009. This is unlikely to be all the extreme weather events in Aberdeenshire due to its rural location but it is the number of events which were big enough to cause an impact to enough people or property for the local media to record it.
- 7.2 The events were collected putting emphasis on finding a diverse range of severe weather events to show how an array of different weather events could impact on Aberdeenshire and the degree to which the Council was affected.



- 7.3 The most frequent type of severe weather event relates to 'Frost / Ice / Snow', followed by 'Excessive rainfall / Flooding'. These accounted for almost two thirds of all weather types recorded. The weather event headings and impacts are used in accordance to the LCLIP guidance.

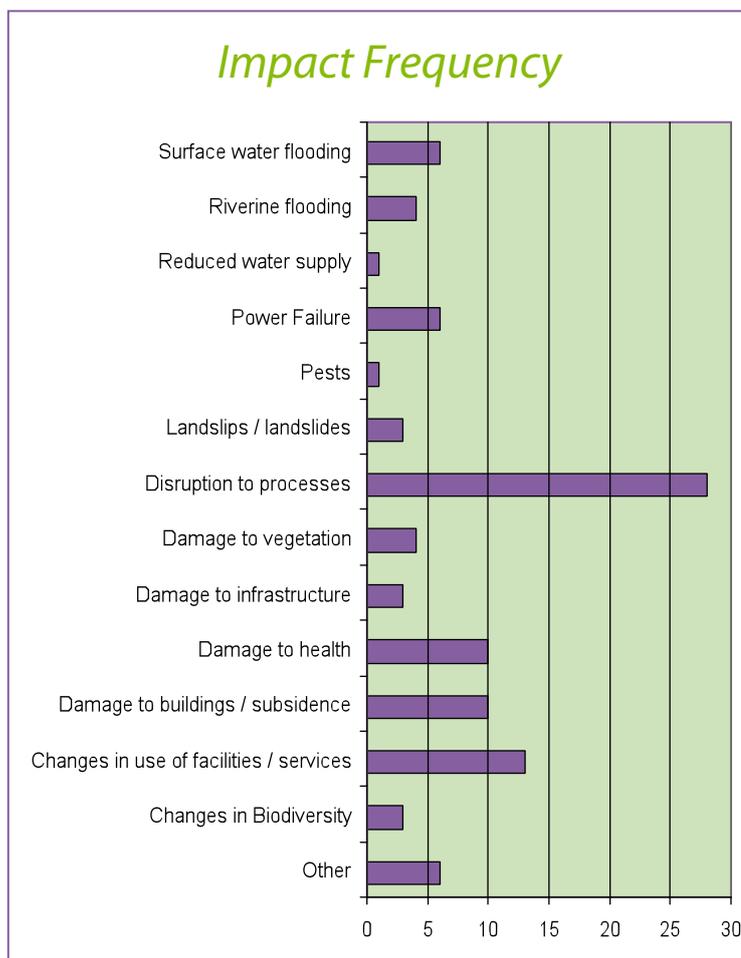
Impact

7.4.1 One of the main parts of a LCLIP is the impact and consequences of the extreme weather. Below is a table which shows the main impacts of the extreme weather recorded. Disruption to processes was by far the largest impact of the extreme weather. Disruption to processes includes, roads closed, public transport disrupted or stopped and school or business closures.

This table is for LCLIP reporting purposes and does not reveal the full impact of severe weather, some weather events recorded more than one impact.

Apart from the devastation that flooding can cause to property and infrastructure, the day-to-day severe weather that the Council has to deal with - such as frost and ice on roads - often leads to significant disruption with road and rail closures, school closures and staff unable to attend work.

7.4.2 The Transportation and Infrastructure Service within the Council was involved in more than half of the recorded extreme weather events. This can be directly related to the 'disruption of processes' impact in which it is this Service's responsibility to deal with.



7.4.3 Some Interesting Findings

7.4.4 During the media trawl of extreme weather related events there were a few surprising articles. Rather than the almost expected snow and ice related stories in Winter and hot weather in the Summer below are a few headlines which were not expected in the local media in Aberdeenshire which were weather related.

- "County plagued by rats as temperatures fall" Press and Journal 02/01/01 – rats sought refuge from weather in homes and farms.
- "Oilmen kept offshore by heat induced fog" Press and Journal 03/07/01
- "Tornado twists but leaves no destruction" Press and Journal 02/07/02 – Thundery weather causes a Tornado
- "Seven treated in E.Coli Outbreak" BBC 28/08/08 - Heavy rainfall contributes to E.Coli in private water supply.

7.5 Business Impact

- 7.5.1 Although this LCLIP mainly focuses on how Aberdeenshire Council has dealt with extreme weather. How businesses and as such how the economy is affected by weather is an important issue that needs to be recognised.
- 7.5.2 Aberdeen and Grampian Chamber of Commerce who are members of the North East Scotland Climate Change Partnership carried out a survey of their members during the bad snow in January 2010.
- 7.5.3 This showed that the general level of activity within the businesses surveyed had not been affected at all in 21% of cases, to a minor extent in a further 44%, and to a noticeable extent in the remaining 40%, with 12 % seeing a more substantial impact on their businesses. The reasons given for the impact on business activity were cancellations of meetings, offshore flights and appointments; the impact of the weather down south, reduced customer levels in the retail sector on the worst days, early closures for safety reasons, and un-cleared pavements.³

7.6 Housing

- 7.6.1 Although Housing was not a specific issue raised by the media trawl whilst carrying out the LCLIP, housing was raised as an issue in interviews and is likely to be a big issue in the future for climate change proofing homes; where homes are built, how they are built and energy efficiency as well as the issue of fuel poverty. The Housing Service within the Council said the weather had caused issues with high winds – impacted on response of repairs, the most common problem is frozen pipes and problems relating to dampness and condensation have increase. Problems include that many of existing homes in Aberdeenshire are built of granite which are difficult to insulate using traditional or cheap methods of insulation.
- 7.6.2 7,000 of the 13,000 Council houses are off mains gas and as such many have to rely on electric or oil heating which is more expensive. Full poverty is a big issue in Aberdeenshire with 33% of households in fuel poverty⁴ For Scotland this is 25%⁵

³ AGCC Assessment of the weather impacts on businesses in the NE January 2010.

⁴ Fuel Poverty is defined as: A household is living in fuel poverty of, in order to maintain a satisfactory heating regime: it would have to spend more than 10% of its income on all household fuel use.

⁵ Scottish House Condition Survey published May 2010.

7.7 Transport and Infrastructure

7.7.1 In both the media search and interviews issues with transport and infrastructure as a result of extreme weather appear to have the biggest effect on the largest number of people. The research showed that snowfall is the largest problem as it uses the most resources. Road closures lead to school closures etc. An increasingly large problem is damage to roads due to 'freeze, thaw', more repairs are being carried out and can lead to pot holes and increased costs to the Council for winter maintenance. The Transport and Infrastructure Service does have a sophisticated road monitoring system (Met office provide forecast) and has a one and a half hour response time on average with two and a half hours for task completion. In order to help keep roads clear of snow they have contracts with over 100 farmers to use their tractors. At present the Service does its best to provide sandbags if necessary during flooding but this is a grey area – there is no legal obligation but high public expectation.

7.8 Environmental Health

7.8.1 Aberdeenshire has highest number of private water supplies in Britain (About 8,500) this means there is a high degree of risk with contamination and infections. Summer heavy downpours lead to more contamination. Water percolating through contaminated land could contaminate ground water sources. Dry spells of weather could lead to increased levels of PM10, which could affect health.

7.9 Emergency Planning

7.9.1 Although climate change is not mentioned directly in emergency plans within the Council, measures have been put in place to deal with situations that could arise as a result of events such as flooding and infrastructure damage, people unable to get to work etc.



Case Study, Flooding in Stonehaven, 1 November 2009.

8.1 On Sunday 1 November 2009, Stonehaven experienced very serious flooding as a result of the River Carron overtopping its banks upstream of the Green Bridge. This was caused by over 50mm of rain (2/3rd the monthly average) falling in a period of 13 hours with the intensity increasing dramatically late afternoon. The ground was already saturated following a fortnight of exceptionally wet weather. The flood water settled in Cameron Street, Barclay Street, Allardice Street, Evan Street, Bridgefield, Arbuthnott Place and High Street affecting around 100 properties, many of which had to be evacuated in the night. This flooding has been classified by SEPA as a one in two hundred year event.⁶

8.3 A report about the flooding in Stonehaven went to the Policy and Resources Committee at Aberdeenshire Council on 14 January 2010. A further report on the Stonehaven Flood went to the Kincardine and Mearns Area committee on 27 April 2010. It is from these two documents that the main summary of the event, the impact and consequences for local residents and businesses as well as the cost, implications and lessons learnt by Aberdeenshire Council and partners is derived.

8.2 This instance was recorded on the LCLIP media trawl recording spread sheet as:

Press and Journal	Flood chaos returns after North East hit by deluge	02/11/09	Heavy rain flood almost all roads in Aberdeenshire and residents in Stonehaven flooded
Press and Journal	Council hits back at flood action criticism	13/11/09	Angry residents and MSP at council's response to flooding in Stonehaven
Press and Journal	Emergency work to stabilise Stonehaven cliffs	28/11/09	Bervie braes even more unstable after recent flooding

⁶ Kincardine and Mearns Area Committee, 27 April 2010, ommittee Report, Stonehaven Flood, November 2009.

8.3.1 Councillors raised the following issues in the aftermath of the flooding in Aberdeenshire on 1 November 2009 as part of a Scrutiny and Audit Committee investigation.

- Concerns about availability of sufficient sandbags
- Concerns about lack of knowledge of drainage systems
- Concerns about level of ditch cleaning and gully emptying
- Concerns about lack of dredging of watercourses
- Concerns about capacity of drainage systems in new developments
- Concerns about landslips
- Concerns about lack of awareness of emergency procedures and contact numbers
- Concerns about lack of public awareness of how to respond
- Concerns about lack of clarity of role of Councillors and Community Councils
- Praise for a job well done given the limit of available resources
- Need for better warning systems and communication with public and businesses
- Need to promote concept of self help and being prepared
- Need access to larger pumps.

8.3.2 *Priorities for improvement*

- Communications
- Forecasting
- Sandbags
- Emergency Plans and training * The Duty Officer * Purchase flood gates for doors and vent guards to be offered for sale to public at cost price.

8.4 RECOMMENDATIONS AND WORK HAPPENING TO IMPROVE

8.4.1 On call Council staff need to be trained in emergency planning and rest centre management.

8.4.2 Public need to be clear on who to contact in instances such as flooding and what they need to do in their area. Where rest centres will be etc. All public regardless if they need accommodation or not should be encouraged to go the rest centre in the first instance so their details can be taken and the Council knows how to contact them in the future.

8.4.3 A decision needs to be made about sandbags. Should they be provided and if so where should they be made available?

8.4.4 The strategic co-ordinating group needs to meet early in the event of a possible flood. This was brought up in interviews that in hindsight it would have been useful for the strategic co-ordinating group to meet earlier in the day on the 1st of November. This group need access to accurate and timely weather and flooding information. Although it is noted that the quality of weather information obtained from the Met office has improved as a result of the flooding.

- 8.4.5 Letters to insurers have been produced by the Community Council and are available to anyone who is struggling with insurers or potential future insurers due to the flooding.
- 8.4.6 Lessons have already been learnt from the flooding in November 2009. The duty officer will now contact the duty communications officer to ensure communications and key messages get out to the media and the public as soon as possible in order to let members of the public know where rest centres are and who they should contact for further advice or help.
- 8.4.7 The Council also plans to purchase door and vent guards which the public will be able to purchase at cost. This will help residents to become more self reliant and protect their homes if they live in an at risk property for flooding.
- 8.4.8 Improved data is now coming from SEPA in regard to river levels and weather information from the Met Office.
- 8.4.9 Modelling of the River Carron in Stonehaven is now being carried out to help make decisions on any improvement works. This is starting from scratch as there is no previous model of the River Carron.
- 8.4.10 Communications and improving them is a key learning point. The duty officer will now contact the duty communications officer in any future event which should help this. There is also an idea of setting up a specific number with recorded messages which would be distributed through the media.
- 8.4.11 Overall the Community has come together. There was a Stonehaven Flood Relief Fund set up to relieve hardship for those affected by the flooding. A Flood support centre was set up and a furniture 'bring to give' scheme run by volunteers has been very successful. The morning after the flooding, local churches opened a soup and sandwich centre at St Bridget's, housing staff, roads and waste staff were available to help and to ensure streets were clear and swept. Grampian Fire and Rescue Service continued to pump out houses and premises and Environmental Health staff were on hand to visit premises and give advice.
- 8.4.12 The Scottish Flood Forum has been praised by the Council for its support to the Council, its partners and the communities affected by the flooding.

Recommendations

Recommendations from the LCLIP include:

9.1 Form a climate change adaptation sub group

Through the interviews it is clear that many of the Council's staff and partners are already adapting to climate change even if they don't call it that. It may be done under risk or emergency planning or resilience and preparedness under new legislation.

9.2 At the moment a lot of this work is undertaken by specific services separately and the issue of climate change adaptation could be tackled better by sharing resources and best practice by involving Staff, Councillors and partners by setting up a sub group focussed on Climate Change Adaptation. There is currently the North East Scotland Flooding Advisory Group which deals with Climate Change Adaptation in regard to flooding, but not a group which looks at the wider aspects of Climate Change Adaptation. This could perhaps be taken on by the Sustainability Officers Group and Sustainability Sub-Committee as part of these groups' wider role or as part of the Aberdeenshire Community Planning Partnership's Sustainable Environment Theme. Further work is required to better understand how Council services will be impacted by future changes in climate. LCLIP has given an indication of some of the issues that are likely to occur, however more work is required to identify how services will be impacted by projected changes in climate. This work could be developed by the sub group.

9.3 Aberdeenshire Council may also wish to recommend reviewing all existing Council policies and strategies to identify whether adaptation is considered in them and how it might be integrated in the future.

9.3.1 Alert System

9.3.2 There appears to be some confusion on who to turn to when a crisis arises. By creating a hub for information, people will know who to turn to regarding specific events. Included would be the emergency numbers for responsible services and authorities and keeping the media informed so they in turn can inform the public. This was highlighted in the flooding in Stonehaven in November 2009 when the on call duty officer within Aberdeenshire received around 200 calls and Grampian Fire and Rescue Service received over 350 calls which they described as their busiest night!

9.4 Royal Commission on Environmental Pollution has drawn up a list of ten points – an “adaptation test” for UK institutions:

1. identify the range of impacts on activities and responsibilities (some may be affected more than others)
2. understand the nature and limitations of climate projections (uncertainty)
3. recognise it is an open-ended process not one single action
4. frame the questions correctly and identify risks
5. identify options and devise flexible plans/strategies
6. embed adaptation into the organisation and make senior people accountable
7. is the institution fit for purpose, aware of its powers and duties, and are there actions that would make it more difficult or impossible to adapt?
8. identify barriers and stakeholders
9. establish mechanisms to respond to alternative views
10. planning and investment cycles – make allowances for new information

Conclusion

- 10.1 Overall Aberdeenshire Council and its partners deal with most extreme weather events as business as usual. The Council is resilient and in extreme circumstances such as the flooding in Stonehaven it copes.
- 10.2 Over the past ten years there have been around 65 recorded extreme weather events. Most of the impacts and consequences were down to infrastructure such as roads being blocked or unsafe to drive/walk on due to ice or snow. Most of the impacts have been short term and the main issues have been when the weather has damaged property or infrastructure and has cost the Council and its partner's and members of the public, time and money to repair them.
- 10.3 The main issues appear to arise when an extreme weather event happens out of hours such as the Flooding in Stonehaven on Sunday November 1st 2009 and if the weather event is prolonged such as the bad winter in 2009/10.
- 10.4 Many staff and services within the Council are already adapting to Climate Change, they are just not calling it that but overall Aberdeenshire is in a good position to start focusing more on Climate Change Adaptation.
- 10.5 Climate Change is happening and the Council will need to consider adaptation in future planning decisions for the area. Climate Change is likely to bring with it positive and negative changes. Positive consequences could include new crops or businesses starting in Aberdeenshire.
- 10.6 Climate Change needs to be taken seriously so Aberdeenshire Council can encourage and take advantage of the potential opportunities it may bring as well as adapt and prepare to be resilient for potential negative impacts such as flooding or coastal erosion.
- 10.7 This LCLIP has been a useful process in order to raise awareness and highlight Climate Change adaptation. It has highlighted what extreme weather events have affected Aberdeenshire in the last decade and how Aberdeenshire Council and its partners have dealt with it. It has also considered how the Climate in Aberdeenshire is likely to change and the potential to use tools such as UKCIP '09 more in the future as part of wider decision making.

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Scottish House Condition Survey, May 2010

SNIFFER, LCLIP, Local Climate Impacts Profile, A Guidance Note for Scottish Local Authorities March 2009.

Adapting Institutions to Climate Change, Summary Report (2010) Royal Commission on Environmental Pollution

Websites:

<http://ukclimateprojections.defra.gov.uk/>

<http://www.grampianepu.co.uk/home.php>

<http://www.sniffer.org.uk/>

<http://www.sccip.org.uk/default.aspx?pid=1>

<http://www.metoffice.gov.uk/climatechange/science/monitoring/ukcp09/>

www.aberdeenshire.gov.uk

Newspapers Online and paper versions: Dates and articles in detail available in Appendix 2, LCLIP spreadsheet.

The Telegraph

The Donside Piper

The Deeside Piper

The Evening Express

The Press and Journal

BBC News

The Guardian

The Scotsman

The Times

Inverviews:

David Cooper, Environmental Health, Aberdeenshire Council

Bill Lennox, Transportation Services, Aberdeenshire Council

William Munro, Area Manager, Kincardine and Mearns, Aberdeenshire Council

Stephen McFarland, Transportation Services, Aberdeenshire Council

Dave Thomson, Housing, Aberdeenshire Council

Peter Murray, Grampian Fire and Rescue Service

Supt Ian Birnie, Grampian Police

Norrie Crichton, Risk Manager, Aberdeenshire Council

James Brown, Harbour Master, Stonehaven Harbour

Colin Blackhall, Farmer, Wardend Farm and Weather Station, Durris, Banchory

Edwin Third, Dee River Trust

