Adaptation Learning Exchange

Introductory Programme 2015: Workshop 3 Summary report

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Adaptation Scotland
supporting climate change resilience

Research contractor
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This report was prepared as part of Sniffer's work delivering the Adaptation Scotland programme.

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1 Purpose

Adaptation Scotland ran the third Adaptation Learning Exchange (ALE) introductory programme workshop in October 2015. The focus of the workshop, held in Dundee, was predominantly on severe weather events and the impacts they have. The aims for the day were to understand:

- how weather impacts differ in different places;
- how severe weather events currently impact us in direct and indirect ways; and
- how severe weather event impacts will be exacerbated in the future.

An additional session was held with the support of an external consultant, on embedding adaptation in organisations.

This report summarises the workshop presentations and discussions from the day.

2 The workshop

The information below describes the sessions that were run during the workshop.

Session 1 Progress updates

ALE workshops start with members giving each other an update on the adaptation work they have achieved since the last workshop and by explaining what climate change adaptation actions they are working towards. Below are some of the key points from the presentations.

Glasgow City Council

- A review of Glasgow's Local Climate Impacts Profile (LCLIP) is currently underway.
- A business case briefing note on adaptation has been circulated to senior management.
- The council has signed up to the Severe Weather Impacts Monitoring System (SWIMS) to help monitor and prepare for severe weather events.
- UKCIP's Adaptation Wizard is being explored as a method to monitor risk.
- Discussions are ongoing with the council's Resilience Unit and Risk Managers in order to have climate change adaptation included in the corporate risk register.
- A Climate Change Assessment Toolkit (CCAT) workshop was held with the Sustainable Glasgow Team.
- Three climate change adaptation workshops were held with different council departments: Parks and Open Spaces, Public Health and Waste, and Transport Planning and Roads.
- The council is also working with external stakeholders through two partnership projects, Sustainable Glasgow and Climate Ready Clyde.

St Andrews University

- A flood risk assessment of key assets has been completed, highlighting areas where adaptation action will be required.
- Research has been undertaken to better understand the university's climate impacts, including calculating its carbon footprint.
- A Climate Change Assessment Toolkit (CCAT) workshop was held for senior management where it was agreed that climate change impacts should be included in the corporate risk register. The risk manager has identified two construction projects at risk so far.

- Work is under way to identify processes to map the Local Climate Impacts Profile (to continue to look for support from a student) and to source data from Fife Council, the Tay Bridge, the Forth Bridge and the Rail Network.
- Obtained agreement to run climate workshops with the Estates and Residential Business Services.
- Next steps will include identifying future climate vulnerability, our adaptation priorities and completing the Public Bodies Climate Change reporting template (by 30 November).
- Research will continue on the Local Climate Impacts Profile.
- Climate workshops will be held with the Estates and Residential Business Services to identify climate threats and opportunities with key stakeholders.

University of Strathclyde

- Spent a few weeks understanding the climate change adaptation context and issues at the University.
- Looking to organise a workshop with the Estates Services Team to raise awareness of climate change and to identify the main risk areas.
- Next steps will be to take the findings from the workshop and share them with staff in the Sustainable Glasgow team at Glasgow City Council (Duncan Booker and Sonia Milne).
- Will also be working with the Council areas of Stirlingshire and West Dunbartonshire where we have property in the Loch Lomond and Trossachs National Park, and Renfrewshire and North Lanarkshire where we own land.

**The University of Strathclyde were unable to attend on the day but provided their progress update in advance.*

Dundee City Council

- A Climate Change Assessment Tool workshop was held in August. The adaptation element of this tool has now been completed and an overall action plan is being prepared for discussion at the Council's Climate Change Board in December.
- Weather impacts profile – there has been no further progress with recruiting a student intern from the University of Dundee to undertake this step of the process.
- A discussion/briefing was held with Council's new Elected Member champion for climate change to organise an Elected Members (and senior officers) briefing session for 5th November.
- Obtained support from Dundee Partnership to sign up to new EU 'Covenant of Mayors' and prepare a Sustainable Energy Action Plan (SEAP). This involves six programmes, one of which is Adaptation/Resilience. Seeking approval via CCB on 20/10 before taking to Committee.

Session 2 Weather impacts in the Royal Botanic Garden Edinburgh

The next session provided an introduction to the impacts of severe weather events. Ruth Monfries from the Royal Botanic Garden Edinburgh (RBGE) gave a presentation on how weather events in recent years have affected the RBGE and its regional gardens.

The RBGE was established in 1670. The site in Inverleith, Edinburgh was the first garden and during the 20th century three Regional Gardens were acquired. The four gardens experience quite different weather conditions; Inverleith in Edinburgh is the driest, Dawyck in Peebleshire is the coldest, Benmore in Argyll is the wettest and Logan in Dumfries and Galloway is the mildest. Over recent years, all of the Gardens have experienced most kinds of extreme weather.

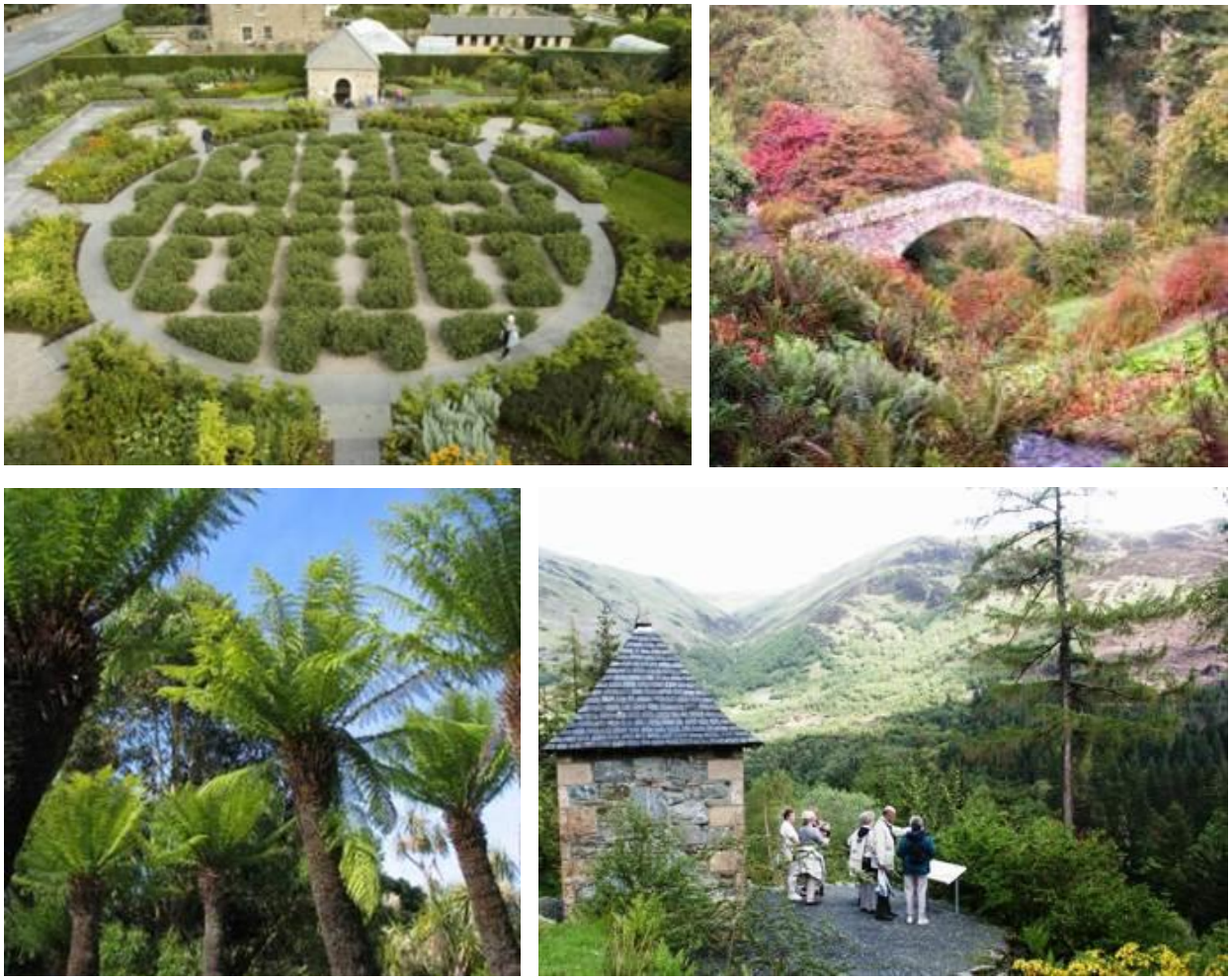

Figure 1. Clockwise from top left: Inverleith in Edinburgh, Dawyck, Benmore and Logan.

Adaptation to these severe weather events is site specific but experience from them is shared between the gardens to increase the resilience to future climate change. To enhance this understanding, research has been carried out to examine in more detail how each of the gardens are affected by the current climate and how they can better prepare for the projected changes in future climate.

The research has shown that there are three clear areas where the impacts are felt the most; the plants, the people and the infrastructure. This is explained in more detail below.

Impact on plants

The most direct impact of severe weather events is on the plants themselves. This ranges from heavy rainfall, to strong winds or an unexpected late frost. At Logan, to protect against plants losses in severe winters, two out of every five tender plants are lifted and moved indoors. Additional windbreaks have been planted using species that are resilient and offer good shelter to other plants, particularly hedges of *Griselinia littoralis.*

In 2012, Benmore saw the wettest June in ten years with 45 per cent above the average rainfall occurring (Martin, 2014). During this time many of the trees, shrubs and lawn were submerged in water, including the iconic Redwood Avenue. Such waterlogging causes physical stress to the plants,

restricting air to the roots and ultimately causing root death. There is no easy solution for this. A number of remedies are being trialled on a small scale within the garden but so far, any possible solutions have been found to cause other detrimental consequences.

Another impact of a warmer climate is the increase and spread of pests and diseases. All of the Gardens invest in biosecurity, for example installing disinfection mats at entrances and placing visitor information about pests and diseases at various locations. Many grass and bark paths are being replaced with surfaces such as gravel that help reduce the potential for diseases to spread, while improving access for staff and visitors.

Impact on people

All the gardens experience closures to visitors and staff in severe weather and as the climate changes this will become more frequent. This causes a number of impacts such as a loss of man hours when staff are excluded from the gardens for safety reasons, a loss of income and disappointed visitors.

The impact on the visitors varies between the gardens as some have visitor centres, cafes and shops outside the pay area and can therefore keep their facilities open. At other gardens the facilities are inaccessible when the garden is closed. Some of the gardens also put on outdoor events in the summer, such as jazz evenings, which can be impacted during adverse weather events.

Common to all the sites is the staff time involved in clearing up the damage caused after a storm. This can involve constructing new gravel paths, putting in new drains, removing fallen trees and replacing broken panes of glass from greenhouses. At Benmore and Dawyck gardens, tree clearance and remedial work is particularly difficult due to the steep terrain. At Dawyck, the removal of one fallen Noble fir took 200 man hours as machinery could not be used safely due to its location.

Impact on infrastructure

Severe weather events also cause damage to the built infrastructure within the gardens. In January 2012, severe gale force winds caused unprecedented devastation to all four of the Gardens. At Benmore, over 100 trees were lost and in Inverleith, 600 panes of glass were shattered in the glasshouses. Many plants from warmer climates, that are usually protected, were left exposed to the winter weather. Furthermore there was not enough glass on site to start repair work immediately. Fortunately, many of the plants were saved due to a mild spell and staff worked overtime to ensure the glass was replaced within the week. Since the storm, more glass is kept on site to replace broken panes more rapidly and research is underway to design more wind-resistant and energy-efficient glasshouse structures.

2012 also brought heavy rain and flooding to the Gardens, damaging the flower beds, lawns and paths. Since then a review of drainage has been carried out with existing drains repaired where necessary, new drainage and soakaways have been installed in areas where the capacity is not sufficient, and climate proofing is built into all ongoing maintenance plans (Martin, 2014).

Session 3 Building resilience to severe weather and a changing climate

The third session of the day was facilitated by Dr Kate Lonsdale who is a freelance facilitator and consultant, associated with UKCIP, Climate Outreach and the Stockholm Environment Institute, focusing on adaptation in practice. Kate's presentation looked at the term resilience and explored recent severe weather events as a starting point for the exercise which explored the impacts of weather events on organisations.

What do we mean by resilience?

There are many definitions for the term resilience. Some definitions imply it is the ability not to sustain damage while others imply that damage can occur and the system will be able to recover from it (Levina and Dennis, 2006). In terms of organisational resilience, the following definition used by the NHS seems most applicable

> *"The ability to cope well with sudden, undesirable, and unpredictable events and maintain business continuity, and learn."*
>
> David Pencheon, Sustainable Development Unit, NHS

Are severe weather events extreme?

The following table highlights the regularity of severe weather events over the last 15 years and questions whether these are in fact extreme weather events or, given the frequency in their occurrence, the new norm.

2000 – flooding	2009 – flooding
2001 – flooding	2009 – snow and ice
2003 – heatwave	2010 – flooding
2005 – flooding	2010 – snow and ice
2006 – drought	2012 – drought
2006 – heatwave	2012 – flooding
2007 – flooding	2013 – heatwave
2008 – flooding	2013 – flooding
2008 – snow and ice	2014 – flooding

Table 1. Severe weather events experienced in the UK over the last 15 years (not including 2015)

Are organisations being affected?

Scottish businesses are already being affected by severe weather that is indicative of projected climate change impacts. A recent report by the Federation of Small Businesses (FSB, 2015) show that two thirds of small UK businesses have been negatively affected by severe weather in the last three years. Many of these businesses have been affected more than once in the last three years. This suggests that few businesses have planned for or taken adequate action to increase their resilience to the types of severe weather events listed above, let alone future climate.

How are organisations being affected?

The impact of severe weather events affects organisations in different ways; from the disruption to service delivery, utilities and transport, to the effects on staff, the direct impact on goods and services, as well as the impact to the building and the financial and reputational cost. Research conducted into the experience and cost of severe weather events over the last three years highlights

the areas of business that are most affected (Federation of Small Businesses, 2015). Table 2 shows that the impact on people (i.e. staff and customers) and logistics (i.e. suppliers, utilities and transport arrangements were the most frequently raised experience. The impact on processes (i.e. impacts on production processes and service delivery), premises (i.e. impacts on maintenance, facilities management or building design and construction) and markets (i.e. changing demand for goods and services) were the most costly.

Impact type	Experience	Cost (average)
People *(e.g. disruption for customers or staff)*	45%	£3,810
Logistics *(e.g. disruption to suppliers, utilities or transport arrangements)*	32%	£1,944
Processes *(e.g. impacts on production processes and service delivery)*	17%	£6,888
Premises *(e.g. impacts on maintenance, facilities management or building design and construction)*	15%	£5,410
Markets *(e.g. changing demand for goods and services)*	14%	£6,150
Other *(inc. Impacts on investment, productivity, insurance, reputation)*	9%	£3,035

Table 2. Impact of severe weather events in small businesses in the last three years.

How will future climate change affect your organisation?

Climate projections for the next century indicate that the climate trends observed over the last century will continue and intensify over the coming decades. The key long term trends for Scotland are that the average climate will become warmer throughout the year and that rainfall is likely to become more seasonal, with an average summer becoming drier, while autumn and winter become wetter (Scottish Government, 2014). As well as changes in average climate, there could be changes in severe weather events. Some of these events such as very hot days and intense downpours of rain could become more common. Others, such as snowfall, could become less common. These changes will bring a wide range of both positive and negative impacts on business.

Session 4 Embedding adaptation in organisations

Kate's second presentation looked at how you embed adaptation in an organisation.

What do we mean by embedding adaptation?

Embedding or mainstreaming adaptation is where adaptation planning and action on climate risk and resilience is integrated into an organisation (or specific function within an organisation) to become business as usual (Inglis et al. 2014). It is about bringing [climate change impacts] into established practices and procedures such as business continuity and asset management (Brown et al. 2011). For this to happen, there need to be changes to organisational 'routines' (Berkhout, 2006) in order for adaptation to become the norm.

Strategies for embedding adaptation

There are a number of different adaptation strategies that can be used within organisations, and these will vary according to an organisation's size, structure, resources and the types of climate impacts it experiences (Fünfgeld et al, 2012). In considering these strategies, organisations should also be aware of any barriers that may prevent these from being realised. The following strategies (taken from Turner et al, 2016) can be used to enable public sector organisations to embed adaptation within their organisation.

1. **Interpret the organisational framing of adaptation**
   When considering a topic, like climate change adaptation, everyone will have a different interpretation based on their own unique experiences and personal backgrounds. Framing is a way of arriving at a shared meaning. It acts as a 'sense-making device' for individuals and organisations as a whole.

2. **Align adaptation with existing policies, strategies and decision making processes**
   Most organisational departments and objectives could potentially be affected by climate change impacts. For this reason, climate change adaptation needs to be effectively aligned with existing organisational strategies and policies. In practice this may involve scanning existing plans and policies to identify climate-related risks and opportunities where adaptation strategies can be incorporated.

3. **Garner senior management support**
   Embedding adaptation implies social acceptance at every level of the organisation but it is important to ensure that senior management understand, support and co-own the process. Senior leaders' support is critical to prioritise adaptation and enable resources to be allocated to a task.

4. **Collaborate within and across organisations**
   Climate change adaptation cuts across many functions of an organisation or a community. Collaborative working is therefore useful to help understand how climate change may affect the different functions of the organisation and its services. Engaging colleagues can also raise the baseline awareness of adaptation and can bring different skills and knowledge to a process.

5. **Encourage organisational learning**
   Working on adaptation requires individual and collective learning. For an organisation to move from adaptation being one individuals' responsibility to adaptation being more broadly embedded across the organisation will require a more advanced learning arrangement. Double and triple-loop learning means analysing lessons learnt and translating these into updated and more informed decisions in the future.

6. **Embrace the need for organisational change**
   For embedding to be successful it is important to understand the structure of the organisation, the processes that exist for supporting adaptation, who is responsible for adaptation work, and who is involved or consulted during the decision-making process. This allows any organisational barriers to be identified and for informed decisions to be made about structural changes.

3 Evaluation

Below is a summary of the feedback from the participants.

What did you find particularly useful?

The participants all left the workshop with different highlights from the day with many commenting on the usefulness of the practical exercises. One exercise that was well received used real newspaper stories about severe weather events to initiate discussion about how a changing climate is already affecting businesses. Another exercise that participants found helpful was around what the participants would do next using a critical path analysis template. The members were asked to think about a goal they wanted to achieve by May 2016, and the steps they needed to complete to achieve their goal. This generated a lot of interest and discussion, with many members keen to complete a Local Climate Impact Profile or weather impact assessment. The group also commented on the usefulness of knowing that they are part of a wider adaptation network that can provide additional support and contacts for working on adaptation work after the ALE Introductory programme.

What was challenging?

All of the participants were asked what aspect of the day they found most challenging. One participant commented that they found reflecting on their organisations progress to date was difficult because they were hesitant about being open about their organisation in front of other practitioners. Another participant, who was new to the group and field of adaptation stated that they struggled to keep up with some of the technical terms discussed on the day. This comment is useful for Adaptation Scotland to be aware of when presenting to a group that may have newcomers or people sitting in on behalf of their colleagues. The only other reflection was in relation to the exercise on severe weather and how challenging it was to think about the impacts in relation to investment and insurance.

What did you learn?

There were many different take-home messages from the group. Some participants identified how much they had learned from the Royal Botanic Gardens Edinburgh presentation, and others liked the idea of how the impact of climate change in gardens could be used to communicate climate change in our everyday lives. Another participant found the use of a timeline for working through an adaptation task was helpful to work out how to practically achieve work on adaptation.

4 Next steps

This third workshop completes the 2015 ALE Introductory Programme. One to one meetings will be held with each of the participants in early 2016 to evaluate the programme. Following this meeting, participants have the opportunity to continue being involved in the ALE through joining the wider ALE Network. As part of this Network, members can complete adaptation work through participating in task groups such as completing a weather impact assessment or a climate risk assessment.

5 References

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Scottish Government (2014) *Climate Ready Scotland: Scottish Climate Change Adaptation Programme* [online]. Available from: http://www.gov.scot/Resource/0045/00451392.pdf

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Annexes

Annex 1: Workshop agenda

Workshop 3: The consequences of climate change

Tuesday 20 October 2015, 10:00 – 16:00
Falcon Scott Suite, Discovery Point, Discovery Dundee, DD1 4XA

Overview of the day 10:00 – 10:05

Progress updates from the ALE members 10:05 – 10:40

Presentations on gathering weather impact information 10:40 – 11:30

BREAK

Why should we care about severe weather and climate? 11:40 – 13:00

LUNCH

How do you embed adaptation in your organisation? 13:45 – 15:15

Next steps 15:15 – 16:00

CLOSE

Annex 2: List of participants

Name	Surname	Organisation
Sophie	Turner	Adaptation Scotland
Joseph	Hagg	Adaptation Scotland
Bryan	Harris	Dundee City Council
Claire	Myles	Dundee City Council
Malcolm	Wilson	Falkirk Council
Sarah	Robinson	Glasgow City Council
Ruth	Monfries	Royal Botanic Garden Edinburgh
Georgina	Stutchfield	University of St Andrews
George	King	University of St Andrews
Kate	Lonsdale	UKCIP/SEI

Adaptation Scotland is a programme funded by the Scottish Government and delivered by Sniffer

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Adaptation Scotland provides advice and support to help organisations, businesses and communities in Scotland prepare for, and build resilience to, the impacts of climate change.

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