



Edinburgh Adapts: From ambition to action

Welcome



Edinburgh Adapts – From ambition to action

#Ambition2Action



Edinburgh Adapts - Progress and ambition

Key note presentations

- **Edinburgh Adapts – Year 1 highlights**, *Councillor Neil Gardiner, City of Edinburgh Council*
- **Business case for adaptation**, *Phil McNaull, Director of Finance, University of Edinburgh*
- **Building resilient**, *Alison Turnbull, Director of Development and Partnership, Historic Environment Scotland*
- **Natural Solutions**, *Johnny Hughes, Chief Executive, Scottish Wildlife Trust*



Edinburgh Adapts – Year 1 highlights,
*Councillor Neil Gardiner, City of Edinburgh
Council*





Edinburgh Adapts

One Year On

Councillor Neil Gardiner, City of Edinburgh Council

4 April 2018 | Royal Botanic Garden Edinburgh





Royal Botanic Garden Edinburgh



Scottish Natural Heritage
All of nature for all of Scotland



HISTORIC ENVIRONMENT SCOTLAND
ÀRAINNEACHD EACHDRAIDHEIL ALBA



EDINBURGH WORLD HERITAGE



THE EDINBURGH PARTNERSHIP

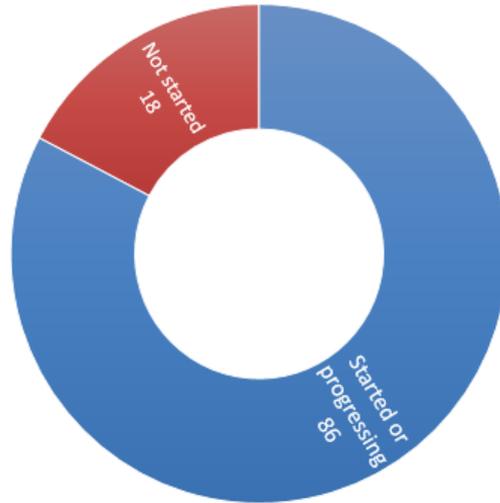


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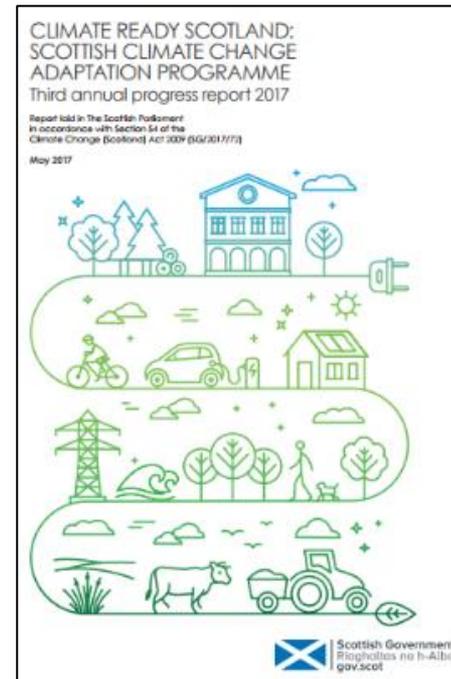


Achievements 2016-17

Edinburgh Adapts Actions



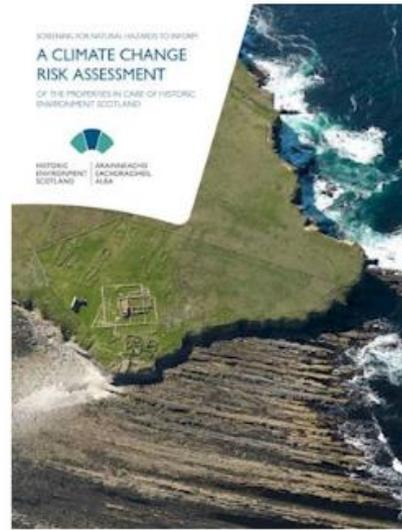
■ Started or progressing ■ Not started





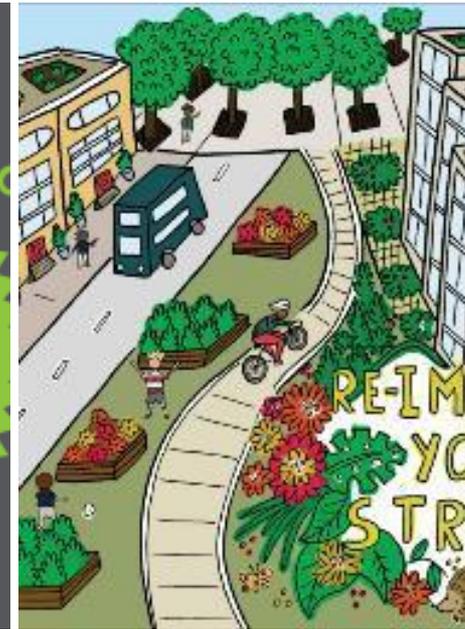
Natural Environment and Greenspace





Built Environment and Infrastructure





Society and Economy



Edinburgh Adapts – Next Steps

From Ambition to Action

- Increase momentum towards achieving the aims of the Edinburgh Adapts vision;
- Continue to develop the evidence base on the risks and impacts of climate change and how these might affect the city;
- Build on all the good work that has already been done and use this to mainstream adaptation good practice across the city;
- Engage at a strategic level with key organisations and stakeholders across the city to embed adaptation fully into organisational processes and plans, and ensure a co-ordinated approach to adaptation across the city.





www.sustainableedinburgh.org



hello@sustainableedinburgh.org



Edinburgh Adapts is a joint initiative of city stakeholders committed to helping Edinburgh adapt to the impacts of climate change. It is led by the Edinburgh Sustainable Development Partnership, with guidance and support provided by Adaptation Scotland.



The Edinburgh Partnership is the community planning partnership for Edinburgh.

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Edinburgh Adapts has been supported by Adaptation Scotland. Adaptation Scotland is a programme funded by the Scottish Government and delivered by Sniffer.

www.adaptationscotland.org.uk



Sniffer is a registered charity delivering knowledge based solutions to resilience and sustainability issues.

www.sniffer.org.uk

Scottish Charity No. SC072375.
Company No. SC148513



**Business case for adaptation, *Phil
McNaull, Director of Finance, University of
Edinburgh***





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Finance

▶ Developing a business case for adaptation

Phil McNaul

Edinburgh Adapts 2018

27th May 2017



Climate Change Impacts in Scotland

We are seeing an increase in extreme weather events such as:

Storm Frank in 2015, severe flooding in Scotland (BBC News Scotland 30 December 2015, <http://www.bbc.co.uk/news/uk-scotland-35195275>)



Climate Change impacts in Scotland

Most recently, the Beast from the East, Storm Emma

(Sky News 2018,
<https://news.sky.com/story/weather-forecast-snow-showers-will-keep-coming-11268255>)



Impact on the University of Edinburgh



- Flooding – during Storm Frank, the Ashworth Building at the Kings Buildings campus flooded with two feet of water; 1 George Square is low lying and water run off enters ducts in the building. Just two examples of impacts
- University closure for 2.5 days during the most recent snowstorm



Business continuity in the face of extreme weather events

Businesses are accepting that climate change is having and will continue to have an impact on their operations.

“In many instances the ‘business case’ for climate change adaptation is not straightforward and can be challenging, especially in determining longer term impacts and considering uncertainties. However, progress is being achieved by practitioners.” Institute of Environmental Management and Assessment (IEMA) 2013

<https://www.iema.net/assets/uploads/CCA%20Business%20Case%20Guidance%202013>

Key areas of business risk



UK Climate Impacts Programme identified key areas of business risk and impacts:

- Changing markets – demand for goods/services
- Business logistics – supply chain, transport, utilities disruptions
- Business premises – buildings and sites
- People – employees etc
- Industrial processes – especially when weather-sensitive
- Company finances – disruption/damage causing losses

Key business risks for the University of Edinburgh

- Core University activities: research, learning, teaching, operations, investments, partnership working.
- **Physical Risks:**
 - Increased flood risk, threatening the Estate
 - Changes in the balance between heating and cooling, leading to the need to adapt design, management and use of buildings and surroundings
- **Physical and Supply Chain Risks:**
 - Global energy market impacts affecting supplies and security, and possible disruption to global water supply
 - Possible transport, energy and communication network disruptions



Key business risks for the University of Edinburgh

Reputational Risks:

- Potential decrease in student enrolment and international collaborations due to lack of resilience
- Damage to reputation due to perceived lack of action or leadership in adaptation, considering commitment in the Climate Change Strategy 2016



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Our business case for adaptation

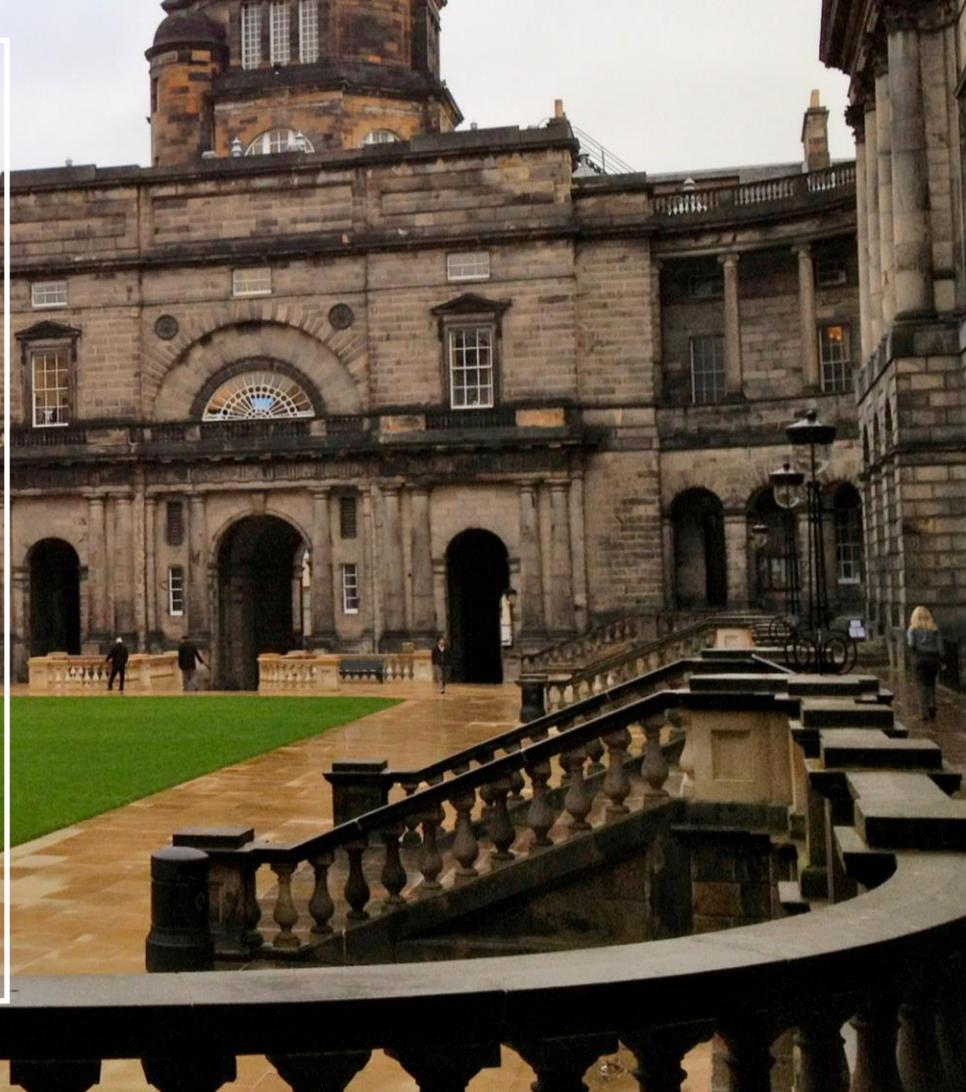


We are developing a University of Edinburgh-specific business case, drawing from:

- Adaptation Scotland Guidance
- Environmental Association of Universities and Colleges (EAUC) Climate Risk and Resilience Working Group, recently formed and providing business case guidance to FE and HE once reporting is completed by Autumn 2018
- **MSc Carbon Finance student consultancy project this semester to develop a business case for adaptation**

Our business case – Carbon Finance project

- Qualitative analysis of climate change case studies relevant to the University of Edinburgh context to propose best practice adaptation solutions
- Focus on traditional building stock, but consideration of non-traditional, landscaping and engagement and communication
- Includes collation of data on predicted climate change in the East of Scotland and impacts on traditional buildings
- Identifies gaps in our data that need to be filled in order to conduct a detailed cost benefit analysis of different measures



Our business case – Carbon Finance project



Recommendations:

- Natural ventilation, replacing/upgrading of external doors, window insulation, wall insulation are key measures to implement to adapt traditional buildings to a changing climate
- Proactive approach: proper adaptation assessment, implementation and monitoring of traditional buildings
- Adopt a comprehensive approach, confirming what is set out in the Adaptation Strategy

University Adaptation Strategy



The business case development forms part of the University Adaptation Strategy, currently drafted and awaiting approval by Autumn 2018, which will include detailed mapping of risks across core activities and applying a whole institution approach. Such action in adaptation will lead to:

- **B**uilding resilience and opportunities: for example, expansion of green spaces on campuses has mitigation, well-being and biodiversity benefits
- **F**urther living lab projects to enhance student learning experience of real world problem solving and contribute to University development in this space.
- **M**eeting adaptation requirements to comply with Public Bodies Duties under the Climate Change (Scotland) Act 2009

**Building resilient, *Alison Turnbull,*
Director of Development and Partnership,
*Historic Environment Scotland***



Natural Solutions, *Johnny Hughes, Chief Executive, Scottish Wildlife Trust*



Panel discussion and Q&A



Edinburgh Adapts – Leading action

- **University of Edinburgh Adaptation Strategy and projects**, *Dave Gorman, Director of Social Responsibility and Sustainability, University of Edinburgh*
- **Adapting traditional buildings**, *Mairi Davies, Climate Change Manager, Historic Environment Scotland*
- **Adapting Edinburgh's coast**, *Fiona Macleod, Senior Policy Officer, City of Edinburgh Council*
- **Green infrastructure: flood management and community engagement**, *Ruth Monfries, RBGE; Dr David Kelly, HWU; Leonie Alexander, RBGE*





University of Edinburgh Adaptation Strategy and Projects

Dave Gorman

Director

Department for Social Responsibility and Sustainability



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 /EdinburghSustainability



Social Responsibility
and Sustainability

Effective use of space
& energy

Policy and behaviour
change

Investments in, or
purchase of, renewables

Changes to our
investments

Learning & research into Challenges / Solutions

Whole institution approach to climate change



Whole Institution Approach to Adaptation

- Climate Change Strategy 2016 addresses mitigation and recognises the role of adaptation in a whole institution approach
- **Why adaptation? To ensure that the University is more resilient in the face of climate change, and continues to lead in research, learning and teaching in adaptation that has value well beyond the confines of the estate**



Adaptation

Risk of drought



Need for adaptation



Risk of flood



Disruption of transport
and communications



Disruption of energy



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Social Responsibility
and Sustainability

Adaptation Strategy Priorities and Case Study Projects

Focusing in on research, learning, teaching priority areas:

- Mapping and ranking of risks to research (e.g. materials, samples, equipment)
- Considering new ways of teaching to widen participation and enhance student experience (e.g. remote teaching options, attracting students from climate change vulnerable countries)
- **Expanding the living lab approach (e.g. applying adaptation research to university campuses)**



Living Lab: Trial of the Natural Capital Standard for Green Infrastructure

Pollock Halls Existing Site:

- Masters student placement with SRS to test use of the Scottish Wildlife Trust's NCS, which gives a score to green/blue infrastructure, as part of action for adaptation, biodiversity and staff and student well-being
- Mapping and categorising of green spaces undertaken using physical maps and mapping software with support from EDINA (Information Services) and Scottish Wildlife Trust
- Final report will include scoring of Pollock Halls and review of tool suitability to feed back to SWT



Living Lab: Case Studies in Sustainable Development, looking for best practice

- Group of four postgraduate students completing a project for SRS
- **What are UK universities doing through green, and blue, infrastructure and building design to address current and future impacts of climate change and what are the key enablers and challenges to adaptation actions?**
- Profiling key exemplars
- Report completed semester end



University of Salford adaptation refurbishment

Collaboration with Historic Environment Scotland: adapting a traditional building



Hudson Beare Lecture Theatre, Kings Buildings Campus

- Grade B listed postwar (1960s) lecture theatre to be considered for adaptation through insulation and other possible measures
- To serve as a pilot for further action on campuses following the HES Climate Change Adaptation for Traditional Buildings guidance
- Site visit in April to confirm location and refurbishment undertaken over summer 2018

Next Steps

- Continuing to expand on living lab projects
- Exploring how our plans for a carbon neutrality target via the possible use of offsets can be integrated with our emerging adaptation thinking
- Finalising the Adaptation and Biodiversity Strategies by Autumn 2018



Thank you!

Please feel free to contact me at:

dave.gorman@ed.ac.uk



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Social Responsibility
and Sustainability

Adapting traditional buildings, *Mairi Davies,*
Climate Change Manager, Historic
Environment Scotland



ADAPTING TRADITIONAL BUILDINGS

DR MAIRI DAVIES



Effects of climate change

- Warmer, wetter winters
- Hotter, drier summers
- More frequent and severe flooding
- More frequent and severe storm events
- Coastal erosion

All buildings are vulnerable to the effects of climate change



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It is getting wetter...





Why are traditional buildings vulnerable?

- **Poor maintenance**
- Functional details removed or damaged
- Repairs carried out with inappropriate materials
- Redundant chimneys and reduced ventilation





Addressing the impact of climate change

On-going maintenance

LEAST INTERVENTION

Appropriate repairs



Improved conservation techniques

Adaptive (proactive) conservation

External Protection

Relocation

Managed Loss

MOST INTERVENTION

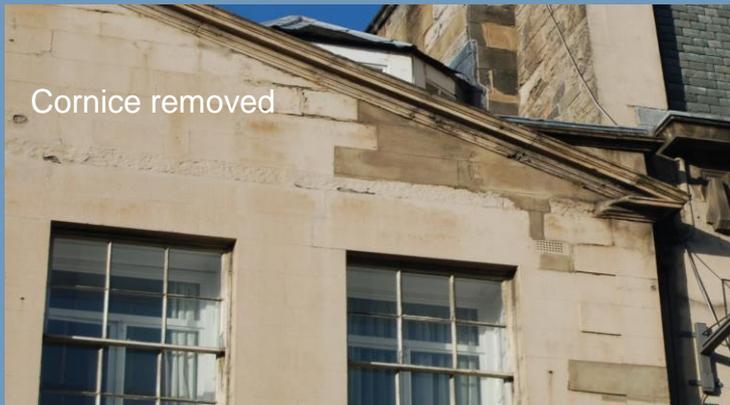


The importance of maintenance and repair





Reinstate weathering details



Detailing for a wet climate...





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Robust repairs – mostly involving lead...





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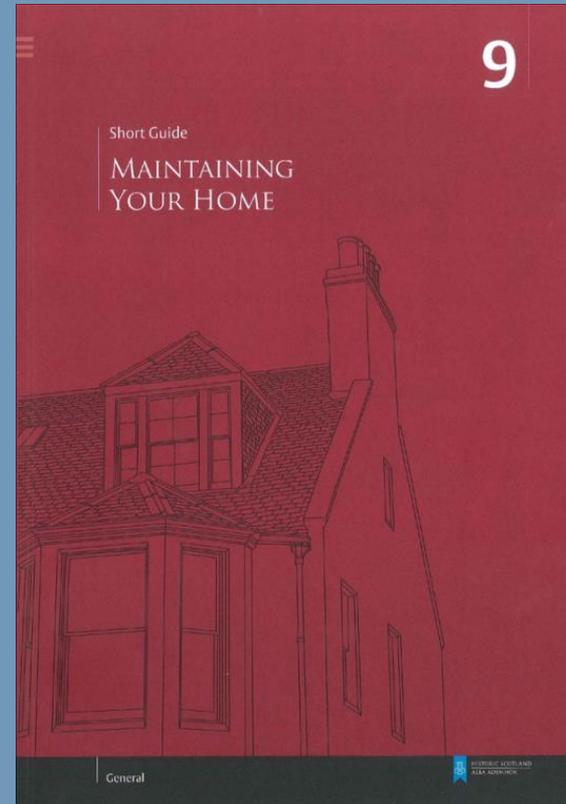


Skilled workmanship & appropriate materials are vital to increase resilience



Summary of Short Guide

- Climate change is happening!
- Many traditional buildings are resilient if well maintained
- ‘Like for like’ may not be enough
- Good repair and maintenance principles should apply
- Adaptation and sensitive alteration will improve resilience



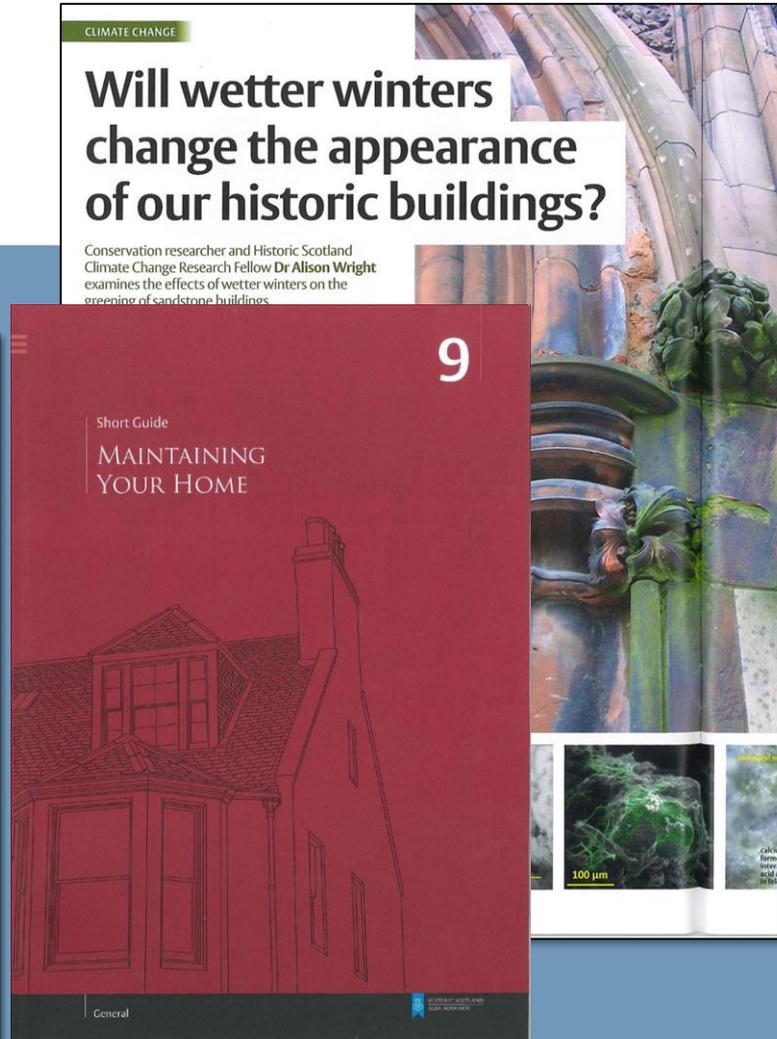
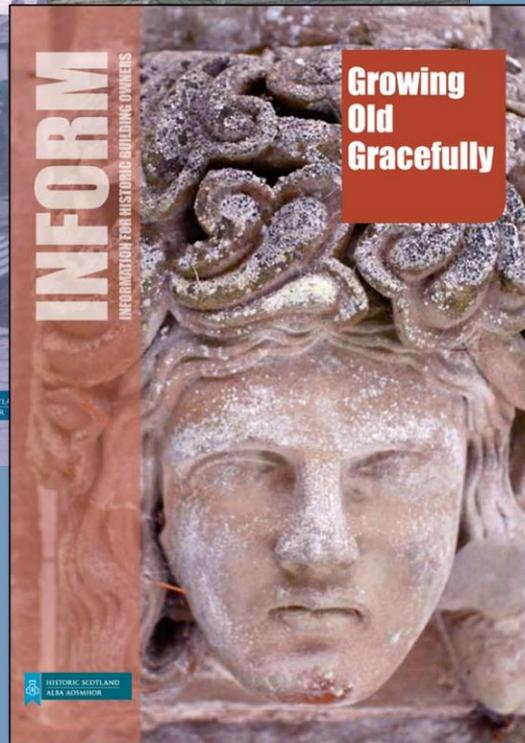
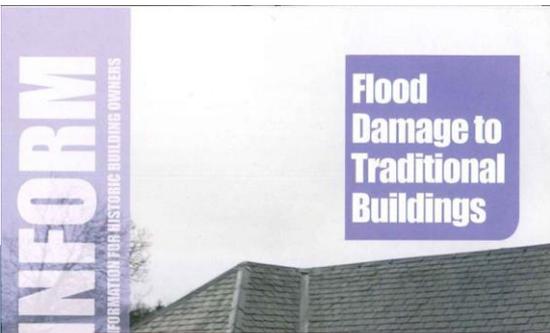


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Arrange a Roof Inspection Carry out Basic Maintenance





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Adapting Edinburgh's coast, *Fiona Macleod, Senior Policy Officer, City of Edinburgh Council*





Edinburgh's Changing Coast

Edinburgh Adapts

Fiona Macleod, The City of Edinburgh Council

4 April 2018 | Botanic Cottage, Royal Botanic Garden Edinburgh

Sea Level Rise and Coastal Erosion







Lighthouse Park

Edinburgh Waterfront Apartments

Entrance Basin

Asda Leith Superstore

Royal Yacht Britannia

Ocean Terminal

Albert Dock Basin

LEITH

A901

A901

Lindsay Rd

A901

Commercial St

Google

The Kitchin

Genting Casino Leith

3D



Regeneration of Edinburgh's Waterfront

Appendix 2 – Whole Place Approach



Edinburgh Adapts Coastal Workshop

20 April 2017 | Edinburgh Centre for Carbon Innovation

A thriving coastal city with wildlife and
beaches on your doorstep #Edinburgh2050

12 December 2017

Category: [Edinburgh2050](#)



Edinburgh City
Vision 2050



Greening the Grey

Progress so far

- Setting the scene
- Raising awareness
- Looking to the future
- Using natural solutions



Next Steps



EDINBURGH LOCAL DEVELOPMENT PLAN





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**Green infrastructure: flood management
and community engagement, *Ruth
Monfries, RBGE; Dr David Kelly, HWU;
Leonie Alexander, RBGE***



Raingarden project



Royal
Botanic Garden
Edinburgh

edinburgh
LIVING LANDSCAPE

HERIOT
WATT
UNIVERSITY

Edinburgh Adapts



ASSESSING AND ADAPTING TO THE IMPACT OF PAST WEATHER EVENTS IN THE HORTICULTURE SECTOR



Royal
Botanic Garden
Edinburgh

Case study: Royal Botanic Garden Edinburgh

Horticulture and visitor services staff at the Royal Botanic Garden Edinburgh (RBGE) and its Regional Gardens are already adapting to climate uncertainty – dealing with floods, prolonged periods of low rainfall, unseasonable temperatures and high winds. This case study looks at the process used to investigate the impact of weather events across the different gardens and how this can be used to best deal with projected climate change.

Scotland's changing climate

We are already seeing evidence of Scotland's climate changing. Over the last few decades our climate has warmed, sea levels have risen, rainfall patterns have changed and we have been impacted by extreme weather events. These changes are projected to continue in the decades ahead.

The UK Climate Projections 2009 data suggests that, for Scotland:

- the average climate will become warmer throughout the year;
- rainfall is likely to become more seasonal with
 - a typical summer becoming drier, and
 - a typical autumn and winter becoming wetter; and
- sea levels will rise.

We can also expect to see:

- increase in summer heat waves, extreme temperatures and drought;
- increased frequency and intensity of extreme precipitation events; and
- reduced occurrence of frost and snowfall.

Source: ukclimateprojections.met.rdg.ac.uk

Adaptation
Scotland
supporting climate change resilience

The process

1. Getting people on board

The first action was to meet with the garden curators to explain the aim of the project, how it would be of value, and the output that would be produced.

2. Gathering information

Next, visits to each garden were arranged to interview key personnel and gather information on:

- observed impacts of current weather conditions and extreme weather experienced; and
- any adaptive actions taken as a result.

- risks related to weather or climate change that have been identified;
- potential opportunities arising from a changing climate; and
- records of garden closures to visitors and staff and historic weather data.

3. Site visit

At each garden, the curator also did a walk round to explain the garden features and see weather impacts and adaptive actions first-hand. Visitor services staff, who are well placed to see the impact of weather events on visitors, were also consulted.

The Gardens

The Royal Botanic Garden Edinburgh was established in 1670.

During the 20th century it acquired three Regional Gardens. The four gardens experience quite different weather conditions; Inverleith in Edinburgh is the driest, Dawick the coldest, Benmore the wettest and Logan the mildest. Together they represent one of the world's largest living collections of plants.

Across the different Gardens, most kinds of extreme weather have been experienced.



RBGE has presented this information as part of the Adaptation Learning Exchange (ALE).

The ALE was set up by Adaptation Scotland to support the public sector plan for the Impacts of a changing climate.



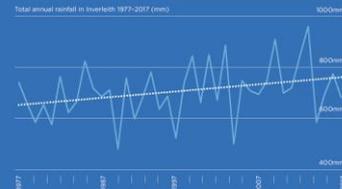
Building a raingarden to reduce waterlogging and pavement flooding



The problem

The climate is changing, and in Scotland heavy rainfall is becoming more frequent and intense.

This graph of total annual rainfall in Inverleith Garden over the last 40 years and shows the upward trend in the amount of rainfall.



↑ After heavy or frequent rainfall areas of the Garden become waterlogged and flooded. We need to adapt to this so that the work of RBGE is not interrupted and the public can continue enjoy the garden.

A Raingarden for Inverleith Climate Ready RBGE



Our solution

In partnership with Heriot-Watt University, RBGE is creating a raingarden on the Birch Lawn to reduce the impact of heavy rain.

A raingarden is a shallow planted basin that allows rainwater to infiltrate (drain) naturally into the ground using free-draining soil. Its planting will include native shrubs, wildflowers and grasses that can withstand occasional flooding while also improving biodiversity.

As well as providing a simple, attractive and wildlife-friendly way of reducing flood risk, we hope our raingarden will provide inspiration for visitors and other institutions who may need to solve similar problems.



OUR PARTNERS IN THIS PROJECT

HERIOT-WATT UNIVERSITY | EDINBURGH UNIVERSITY | EDINBURGH ADAPTS

Left and above, top row: A dense mix of native botanical species that can tolerate a range of conditions has temporary water logging to soils. Below and middle row: A rainwater collector in a garden bed. Bottom row: A rainwater collector in a garden bed. © 2018 RBGE. All Rights Reserved. © Heriot-Watt University. © Edinburgh University. © Edinburgh University. © Edinburgh University.

Planting the rain garden



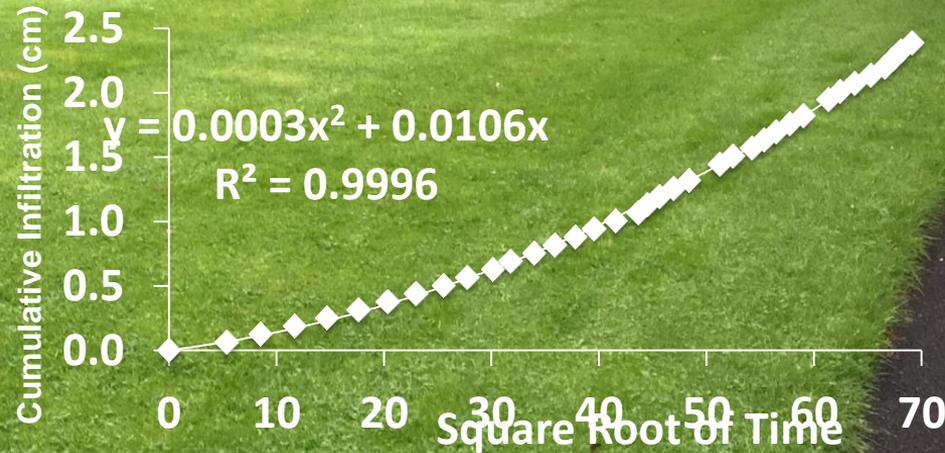
Royal
Botanic Garden
Edinburgh

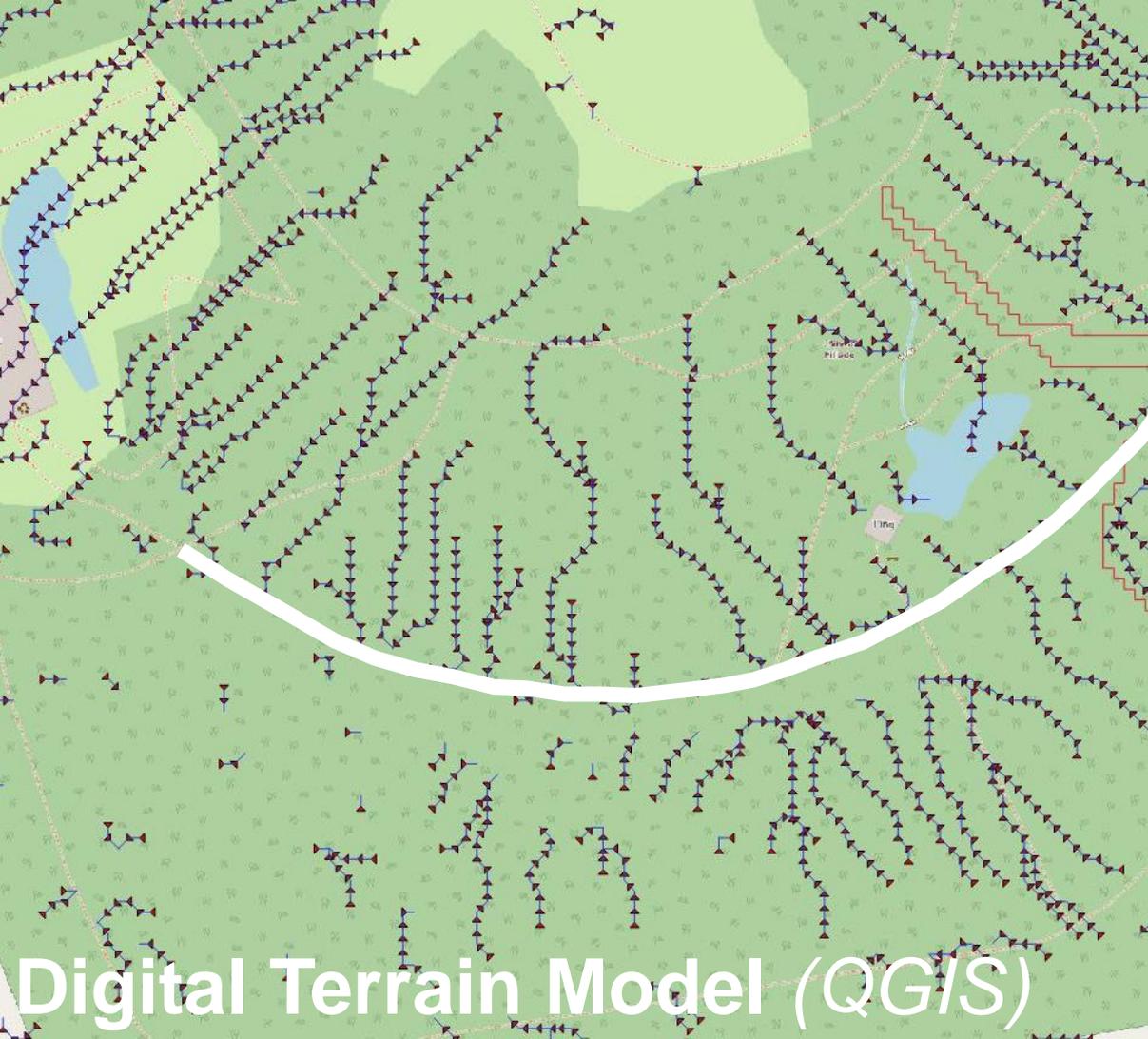
edinburgh
LIVING LANDSCAPE

- Plant selection - able to withstand expected conditions; wildlife-friendly
- Grown in RBGE's nursery in preparation for planting out in early summer 2018



Soil infiltration tests





Digital Terrain Model (QGIS)





RE-IMAGINE
YOUR
STREET



Adaptation Scotland

supporting climate change resilience



Royal
Botanic Garden
Edinburgh



**PE
Training**
October 17



**Photo
Training**
November
17

**Briefing
Event**
November
17

**Shaping
Event**
December
17

Recruitment
January 18

MFN
January 18

**Street
Interviews**
January 18



**Reflection
Workshop**
March 18





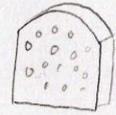
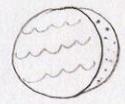
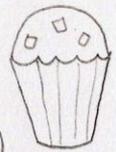


"it actually sparked the creation of the Granton whisky distillery in 2037"

"generally positive! Apart from foam..."



"and it can actually be seen from space!"



"planning permission is being given for more + more flats"



"the driver was economy"
£££



"it turned out it was actually toxic foam"
!



community food

Are there any unused areas in Boswall Parkway that could be used for productive food growing?



community planning

Do you have any ideas about how to introduce community planning in Boswall Parkway?



water well managed

What changes could happen in Boswall Parkway to encourage adaptation?



intergenerational initiatives

Do you have any suggestions where these could happen in Boswall Parkway?



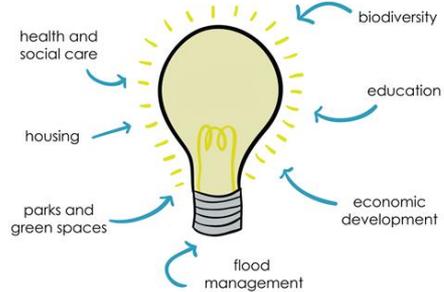
local culture

How would you encourage people to share their culture with the community in Boswall Parkway?



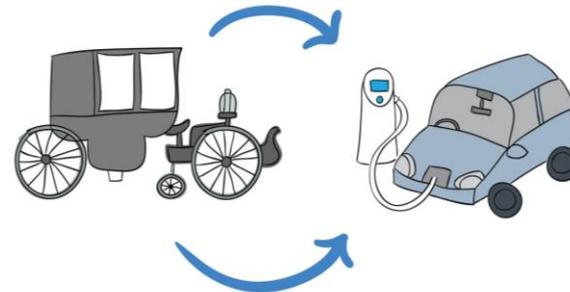
local sustainable development

What projects could happen in Boswall Parkway that would contribute to reducing climate change?



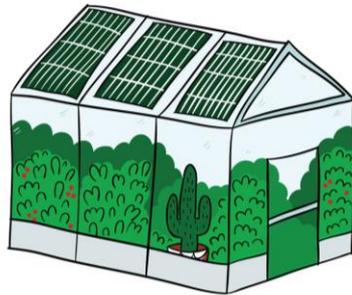
systems approach

Do you have any examples of good practice or ideas where these approaches could be applied in Boswall Parkway?



lessons from past local initiatives

Are there any lessons to be learned from the past?



the role of technology

How could technology contribute to local solutions for climate change?



community gardens

The Boswall Parkway community is already working to grow and share food. Do you have any ideas to develop this, or to create wildlife-rich areas?



make an asset of the shoreline

Could the shoreline be an asset
in terms of tackling climate change?



locally sourced marine food

Do you think there's any prospect
of this in Boswall Parkway?

- I have a back green... they tried to improve it but it didn't work
- Stuff just gets done by the Council
- Priority would be litter and dogs
- I like the green ideas
- We have one of them (water butt) - saves me going upstairs to water the garden
- Like the trees and the water
- I like that one (image of trees) ... it reminds me of home (Gambia)
- We need street trees - gives us fresh air





RE-IMAGINE
YOUR
STREET

Q&A



Immediately after lunch

Workshops – exploring opportunities to go from ambition to action

- Green infrastructure
- Built environment
- Increasing city wide progress





Edinburgh Adapts: From ambition to action





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