Climate Change Adaptation: Strategies for a Resilient Future

December 2025

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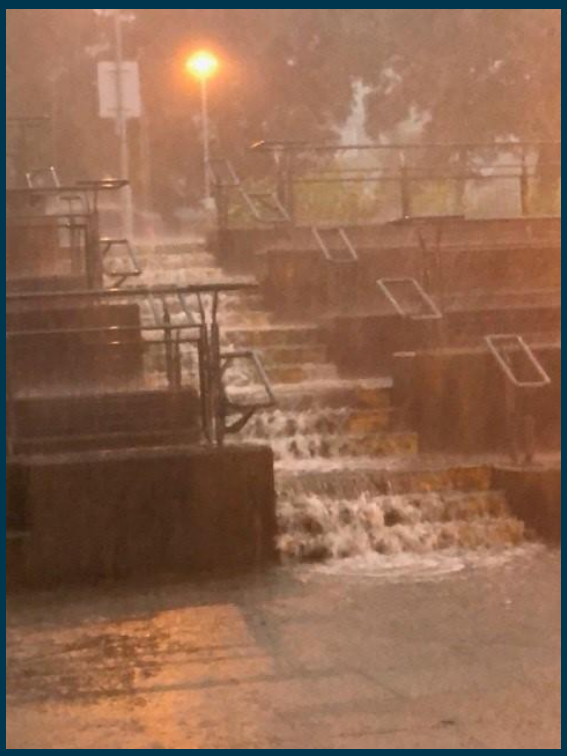

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The authors would also like to thank the contributions from two University of Aberdeen students. Estrid Jonsson, as part of an undergraduate internship, and Nelly Wainaina, as part of an MSc thesis project, researched and developed the foundations upon which this strategy, and associated materials, is based.

Version History

Version	Date	Authors	Reviewers	Notes
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Draft 3	25/08/2025	Roederer Rose Lyne Fraser Lovie	Sustainable Development Committee (SDC)	Draft issued to SDC for review / approval
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1. Introduction

In February 2020, the University launched Aberdeen 2040, a high-level strategic framework that outlined 20 headline commitments around the themes of Inclusive, Interdisciplinary, International and Sustainable that the University aimed to pursue over the next 20 years.

Among those 20 commitments, four relate directly to environmental sustainability and frame the University's sustainability ambition for the period to 2040:

- Encourage everyone within our community to work and live sustainably, recognising the importance of our time, energy and resilience.
- Educate all our students and staff to be leaders in protecting the environment.
- Excel in research that addresses the Climate Emergency, enables energy transition and the preservation of biodiversity.
- Achieve net zero carbon emissions before 2040.

As part of these commitments, we must ensure that our estate and operations are as resilient and as flexible as possible to face the current and expected impacts of climate change. From extended summer heatwaves, to increased rainfall, the changes to our environment have the potential to cause significant damage to our estate or to cause serious disruption to our educational, research, and operational activities.

The University, as part of Scotland's public sector, is subject to legal expectations placed upon us, including through the Climate Change (Scotland) Act 2009 and the associated Public Bodies Climate Change Duties, which require annual reporting of progress on climate action. [1]

As a result, we are expected to ensure we consider how our actions can help deliver Scotland's climate change adaptation outcomes and objectives, as detailed in the Scottish National Adaptation Plan 2024-29 (also known as SNAP3).

> *"Adaptation also needs to be aligned with a public sector organisation's strategic outcomes and priorities, including achieving net-zero targets and resilient, biodiverse natural environments. By doing this, adaptation becomes integral to the functions of an organisation and its ability to achieve outcomes."*
>
> **Scottish National Adaptation Plan: 2024-2029**

As part of our response to these expectations, we have taken the opportunity to develop this, our first formal Adaptation Strategy. This document aims to provide the following:

- A summary of the Climate Emergency and the role of adaptation in responding to it.
- An overview of the climate challenges anticipated for Scotland and for the local area of the Northeast.
- A summary of the key actions to be undertaken to ensure the University's estate and operations are resilient for the current and predicted impacts of climate change.

2. Climate Emergency and the Role of Adaptation

Since the start of the Industrial Revolution in the mid-18th century, human activities have greatly increased the concentrations of greenhouse gases (GHGs) in the atmosphere. Due to these activities, measured atmospheric concentrations of CO_2 are significantly higher than pre-industrial levels.

The scientific consensus is clear that actions carried out by humans, notably the extraction and burning of fossil fuels, are responsible for the current Climate Emergency. [2] This anthropogenic release of CO_2 into the atmosphere, in addition to other GHGs such as methane, contributes to the current exaggerated warming of the planet via the so-called 'enhanced greenhouse effect'.

In 2022 the IPCC noted that 'global net anthropogenic GHG emissions were 59±6.6 $GtCO_2e$ in 2019, about 12% (6.5 $GtCO_2e$) higher than in 2010 and 54% (21 $GtCO_2e$) higher than in 1990 [2].

While the rate of growth has slowed in the past decade, it has continued to rise overall. The IPCC notes that current emissions trajectories make it likely that warming will exceed 1.5°C during the 21st century and limiting warming to below 2°C will be reliant on a rapid acceleration of mitigation efforts after 2030. In 2024 the world saw the first sustained breaching of the 1.5°C threshold according to the EU's Copernicus Climate Change Service.

The consequences of these changes to our climate have been felt across our society and environment: from damage to infrastructure, disruption of vital services, and a marked shift in growing seasons. With the rate of climate related change set to intensify over the coming decades, we need to develop strategies and implement actions now to ensure our resilience.

2.1. Adaptation vs Mitigation

Adaptation and mitigation are both responses to the Climate Emergency but with very different outcomes. Both are integral components of an organisation's overarching sustainability strategy and focus respectively on reducing the climate's impact on us, while simultaneously reducing our impact on the climate.

Mitigation involves addressing the root cause of climate change, i.e., reducing the sources of greenhouse gases (GHGs) and enhancing carbon sinks. Mitigation activities are typically included within Net Zero ambitions and strategies, and can take a variety of forms:

- Replacing fossil fuel-based energy generation systems with renewable alternatives such as solar and wind.
- Retrofitting buildings to improve energy efficiency.
- Replacing fossil fuel-based vehicles and transport infrastructure with alternatives such as electric and hydrogen.

- Enhancing peatland and planting trees.

Our approach towards mitigation activity is outlined in our Net Zero Strategy, approved by the University Court in November 2024.

While mitigation focusses on efforts to reduce emissions, adaptation involves an ongoing adjustment in ecological, social and economic systems to respond to the now unavoidable current and future changes to the climate that will arise as a result of historic human activities.

While mitigation has global benefits, adaptation is typically realised at a regional scale, i.e., at the scale of impact.

Adaptation activities range widely in terms of scale, from small incremental measures such as adjusting summer working practices to avoid excessive midday temperatures, to large-scale investments such as expansion of remote working facilities and drainage networks, and the installation of flood defences.

The timelines for the impact of mitigation and adaptation responses also differ, While the key benefits of mitigation activities implemented today may only be evidenced several decades in the future due to the persistence of GHGs in the atmosphere, many adaptation measures have immediate effectiveness and produce benefits by reducing vulnerability. For example, installing flood defences would help limit the impact and disruption caused as a result of more frequent flooding events. As climate change progresses, the benefits of adaptation will also increase over time. [3] [4] [5]

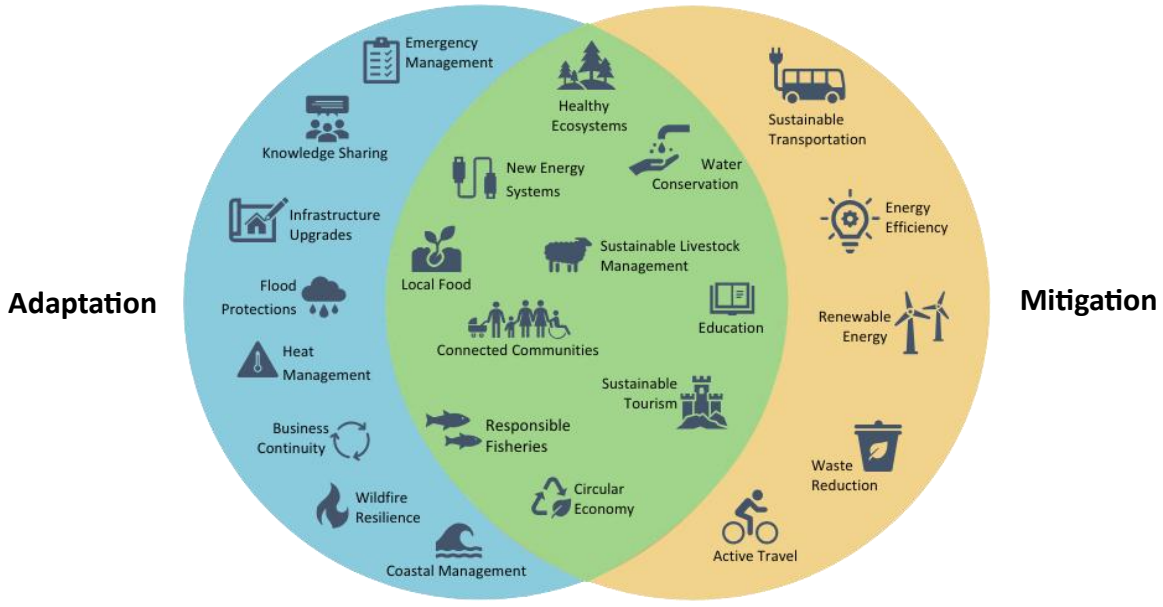


Figure 2-1: Adaptation & Mitigation - Source: Adaptation Scotland [26]

As shown in Figure 2-1, there are synergies between adaptation and mitigation, where certain activities can contribute to both responses to the Climate Emergency.

For example, the installation and maintenance of green roofs in urban area have the following linked benefits:

Adaptation Benefits	Mitigation Benefits
Reduction of heat island effect, thus reducing the impact of increased average temperatures, and increased frequency and duration of heatwaves.	• Reduces energy demand from active cooling and associated emissions. • Provides passive cooling. • A source of CO_2 capture

Table 2-1: Example - Adaptation & Mitigation Benefits from Green Roofs [6]

However, it must be recognised that, unless both adaptation and mitigation are considered as part of the framework for operational decision-making processes, there is potential for conflict between the two if decisions are taken in isolation.

For example, the installation of additional permanent or portable cooling systems e.g., air conditioning units or fans, may be considered as an adaptation measure in response to increased temperatures and heatwaves. This action will, however, result in increased energy demand and an associated increase in emissions, exacerbating the mitigation challenge.

2.2. Adaptation in Scotland

Adaptation and climate resilience are at the heart of the Scottish Government's ambitions to improve the nation's wellbeing, both now and in the future. Reflecting this, as part of the statutory duties within the Climate Change (Scotland) Act 2009, the public sector must in exercising its functions, act:

A. In the way best calculated to contribute to the delivery of emissions reduction targets (i.e. mitigation)
B. In the way best calculated to help deliver the Adaptation Programme
C. In a way that it considers most sustainable.

The Scottish National Adaptation Plan 2024-2029 (SNAP3) sets out a range of objectives and commitments to enhance the capacity of all Scotland's public services and infrastructure networks. [1]

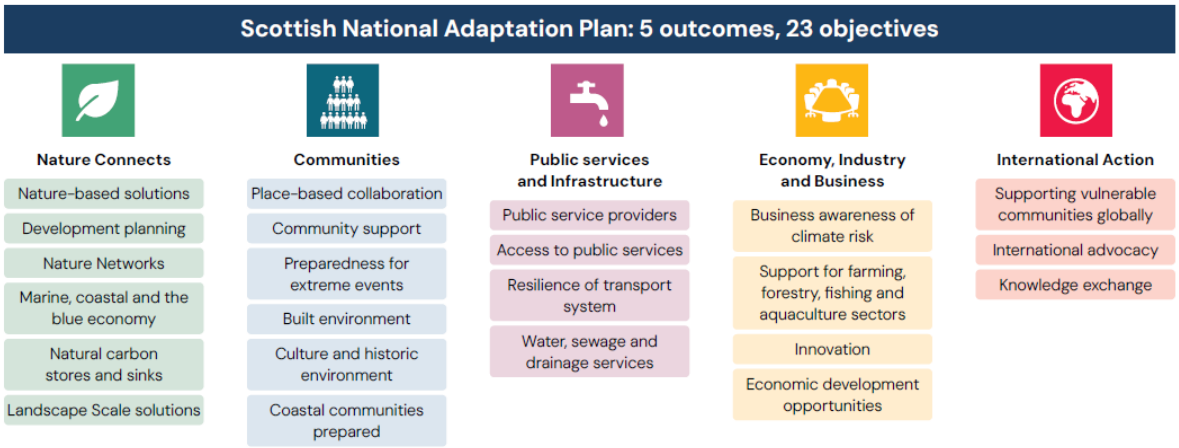


Figure 2-2: Scottish National Adaptation Plan's Outcomes and Objectives

Scottish universities and colleges have a key role to play in the national plan, from the enhancement of infrastructure systems, to engaging with community led action, and the creation of new partnerships.

> *"All public bodies must identify the national adaptation objectives relevant to their functions and act in a way that supports the delivery of these objectives.*
>
> *Organisations will have varying degrees of influence in relation to adaptation in Scotland depending on their particular role, functions and responsibilities, but all public bodies need to be resilient to the future climate and to plan for business continuity in relation to delivery of their functions and the services they deliver to the wider community."*
>
> **Public Bodies Climate Change Duties: Putting Them Into Practice**

3. Climate Challenges: Scotland and the Northeast

While the University's 2040 Net Zero Strategy sets out our ambition and proposed mitigation actions to reduce current and future operational carbon emissions, the impact of historic and current global carbon intensive activities will still have significant consequences. This section spells out the climate context within which our adaptation actions will be framed.

3.1. Observed Trends

Over the past decades, Scotland has been experiencing shifts in weather, temperature, and sea level patterns. All of these have had far reaching consequences on the country's infrastructure, land, farming, pest levels, native species, population health, etc.

3.1.1. Sea Levels

Climate change has been resulting in sea-level rises, contributing to coastal erosion across Scotland and the UK.

Tidal gauges across the UK recorded some of the highest levels on record in 2023, highlighting that sea levels have been rising at rate of up to 4.6mm per year over the past 30 years. [7]

3.1.2. Rainfall

Five of the ten wettest years for the UK since 1836 have occurred in the 21st Century, with 2023 being the seventh wettest year on record. [7]

This has particularly been reflected in Scotland, where there has been an increase in rainfall over recent decades, with an increasing proportion of rainfall coming from heavy rainfall events. Such events often result in surface water and small watercourse flooding.

Over the previous decade (2010-2019), the annual average rainfall increased by 9% compared to the 1961-1990 average, with winters being 19% wetter. [8]

However, despite an increase in the annual total rainfall, the summer and autumn months have been experiencing gradual reductions in average rainfall, leading to water scarcity alerts being issued by SEPA at an increased frequency. [9]

3.1.3. Temperatures

Nine of Scotland's ten warmest years on record have all occurred since 2002, with the average temperature in the last decade being 1.02°C warmer than the 1961-1990 average.

Observations show that extremes of temperature in the UK have been affected much more than average temperature. The number of 'hot' days (i.e. 28°C or more) has more than doubled and 'very hot' days (i.e. 30°C or more) more than trebled for the most recent decade (2014-2023) compared to 1961-1990. [7]

2023 was the second warmest year on record for the UK, with June of that year being the warmest month recorded to date. In Scotland, the warmest year to date was 2022.

Globally, 2024 was the warmest year on record and the first year that saw temperature increases exceed 1.5°C (compared to pre-industrial levels) for sustained periods. [10]

3.2. Anticipated Trends

When evaluating the potential future changes to our environment that climate change may cause, researchers use four Representative Concentration Pathways (RCPs) to articulate different scenarios. Originally used as a basis for the findings of the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) in 2014, RCPs make predictions of how different concentrations of greenhouse gases in the atmosphere will change in future as a result of temperature increases because of human activities. [11] [12]

RCP	Change in Temperature (°C) by 2100 [13]	Description [8]
RCP2.6	1.6 ± 0.4	Also known as the "Low Emissions Scenario", this RCP assumes sustained, rapid reductions in greenhouse gas emissions globally. The projections for this scenario represent the minimum level of climate change we are likely to experience.
RCP4.5	2.4 ± 0.5	Also known as the "Medium-Low" and "Medium-High" scenarios, these RCPs represent two medium stabilised pathways with varying degrees of successful mitigation.
RCP6.0	2.8 ± 0.5	
RCP8.5	4.3 ± 0.7	Also known as the "High Emissions Scenario", this RCP represents the most extreme changes if greenhouse gas emissions continue to increase, and emission reduction targets are missed.

Table 3-1: Breakdown of Representative Concentration Pathways

While progress has been made within the UK and Scotland to reduce greenhouse gas emissions, current global emissions trajectories remain aligned to the medium-high scenario. [8]

To reflect the current global position, in alignment with Adaptation Scotland, and to ensure that actions taken target a high resilience future, the RCP8.5 scenario has been used to project the following anticipated changes to the environment and weather patterns in Scotland and the Northeast by 2050 when reviewing the University's resilience and climate readiness.

Information on the projections for the other RCPs can be found in **Appendix A**.

3.2.1. Sea Levels

Sea levels in Scotland will continue to gradually rise over the coming decades, with an increase of between 9cm and 28cm by 2050 being projected. This will also impact the water levels of any rivers connected to the sea.

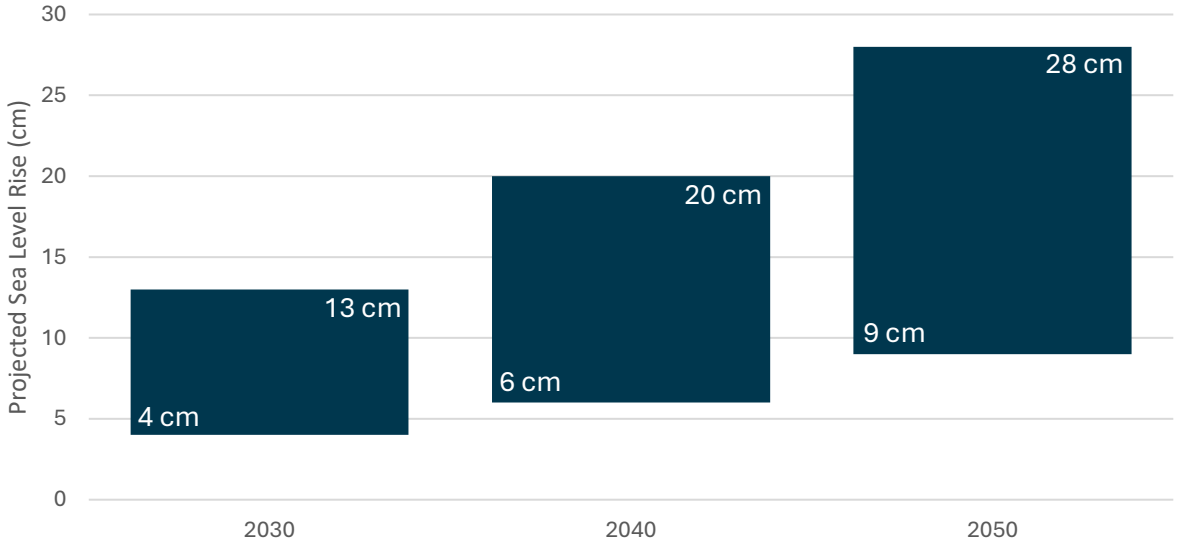


Figure 3-1: Projected Increases to Sea Level (Edinburgh) [22]

3.2.2. Rainfall

Scotland is projected to experience a number of shifts in rainfall trends depending on the season. In the winter, rainfall is expected to increase by 7% by 2050, in conjunction with more intensive rainfall events. [14]

Conversely, summer rainfall is expected to decrease by 7%, leading to an increased frequency of water scarcity events. Research by academics at the University of Aberdeen and the James Hutton Institute, in partnership with Scotland's Rural College, and the British Geological Survey, have projected that water scarcity events will double by 2050, heavily impacting key Scottish sectors. [15]

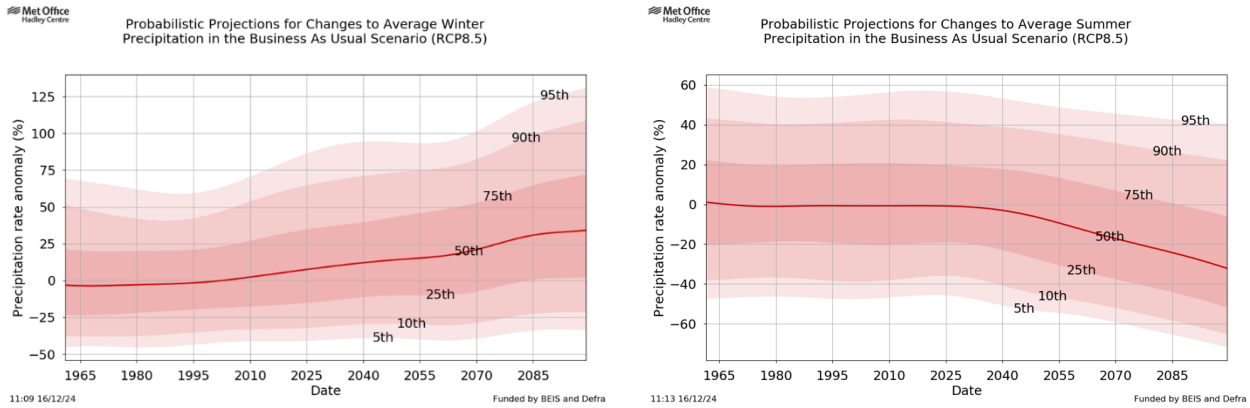


Figure 3-2: Projections of Changes to Average North East Scotland Rainfall for Summar and Winter [23]

3.2.3. Temperatures

Annual temperatures in Scotland are expected to rise by over 1°C across all seasons by 2050. As a result, winters will be warmer, with the potential to reflect current autumnal weather patterns. This will also significantly reduce the likelihood of snow lying and sub-zero weather events.

Although temperatures are projected to increase for all seasons, the summer period is expected to experience the greatest increase. The frequency and duration of heatwaves in the summer months will become even more common, near to 50%. [8] [14]

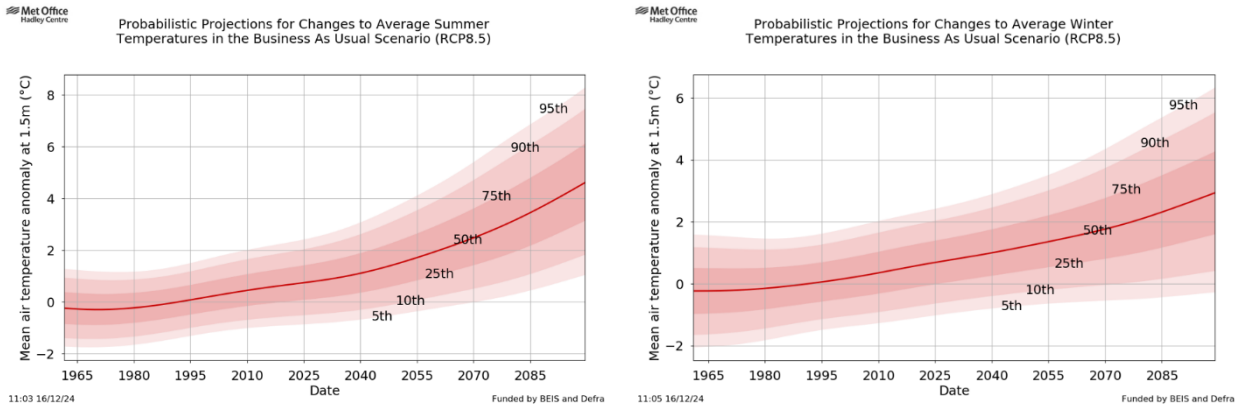


Figure 3-3: Projections of Changes to Average North East Scotland Temperatures for Summar and Winter [23]

3.2.4. Linked Consequences

The projected impacts to sea levels, rainfall and temperatures will have cascading consequences for almost every part of life in Scotland [1]:

- Increased flooding of rivers due to increased rainfall and sudden downpours. Peak river flows for certain Scottish river catchments could increase by more than 50% by 2080. [8]
- Increased frequency of flooding in coastal areas due to increased sea levels and intense heavy rainfall events.
- Accelerated coastal erosion and coastline retreat.
- Increased frequency of road/public drainage systems becoming overwhelmed during typical and extreme rainfall events. This in turn leads to increased surface water on transport routes and greenspaces, causing hazard and delays.
- Shifts in agricultural and green space growing seasons, impacting the availability of food and the overall 'look' of Scotland.
- Establishment of new pests, diseases, and disease vectors which have not previously been seen in Scotland. This will have further implications for the health of people, plants, animals and ecosystems if not carefully managed.
- Risk to our energy supplies from increased wind speeds and storms.
- Negative impact on health and shifts in patterns of diseases, including issues such as heat stress and mental health conditions such as Seasonal Affective Disorder (SAD).

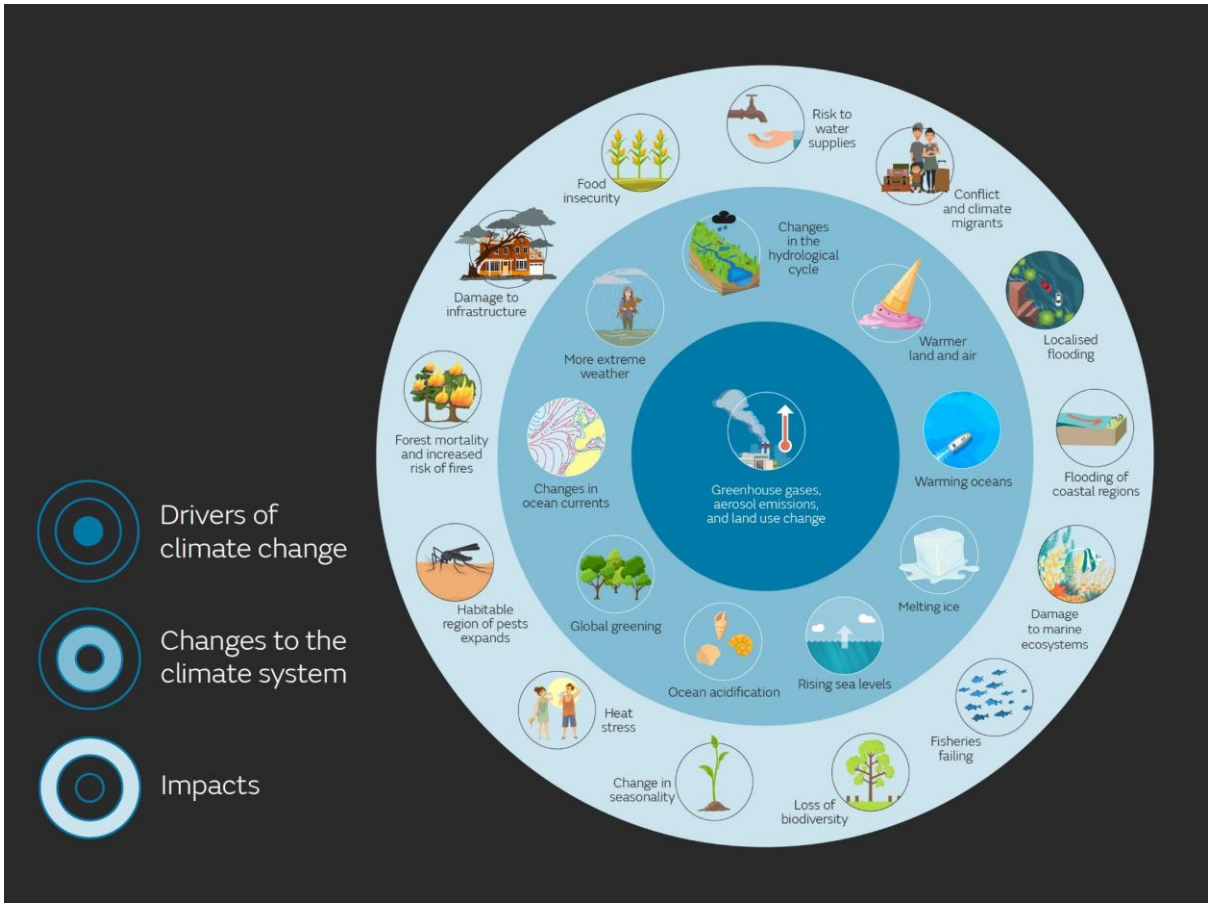


Figure 3-4: Impacts of Climate Change - Source: Met Office [25]

4. Embedding Climate Resilience

Our Adaptation Mission

We are committed to ensuring the resilience of our estate and our operations in the face of the anticipated changes to our climate.

By doing so, we will support the delivery of Aberdeen 2040, ensuring the University continues to thrive in the face of the challenges to come.

As demonstrated in Section 3, the anticipated changes to our climate are likely to have a significant impact and far-reaching consequences for our own estate and operations, but also to have considerable impacts on the surrounding region and civic infrastructure.

By proactively identifying climate related risks and adaptation activities, the University can determine activities and projects that will improve resilience, while also reducing the risk of climate disruption or unforeseen financial impacts.

To ensure the University's everyday operations embed adaptation as standard, in addition to effectively contributing to the Scottish National Adaptation Plan (SNAP3) and meeting the requirements set out by Scottish Government, this strategy has drawn upon the following sources:

- "Public Sector Climate Change Adaptation Capability Framework Handbook" from Adaptation Scotland
- "Climate Change Adaptation and Resilience Guide" by Association of University Directors of Estates (AUDE)
- Shared learning through networks such as Scotland's Public Sector Climate Adaptation Network (PSCAN) and the Scottish branch of the Environmental Association for Universities and Colleges (EAUC)

This climate resilience strategy is intended to highlight these climate risks and their implications across all aspects of the University's activities. Utilising the four thematic areas outlined in the Sustainability Leadership Scorecard (SLS) framework [16], an established model widely adopted by UK universities and colleges, the actions required can be bundled together to demonstrate that this is about more than just estates interventions.

The SLS themes are:

- Leadership and Governance
- Estates and Operations (including buildings and greenspaces)

- Learning, Teaching & Research
- Partnership & Engagement

As well as actions to be undertaken by the University, as part of the partnership and engagement strand the strategy also reflects on the role of other public bodies in the region, namely the NHS and relevant local authorities. It envisages how the University can connect and collaborate with other partners to deliver an ambitious whole system approach to sustainability, net zero, and adaptation-focussed activities, strategies, and ambitions across the region and at national level.

4.1. Leadership & Governance

Reflecting its commitment to sustainability, the University of Aberdeen established sustainability as one of the pillars of Aberdeen 2040, its 20-year strategy.

In line with this commitment, adaptation is recognised as an institutional responsibility and every member of our staff and student communities have a role to play.

To ensure that adaptation is fully embedded and embraced in all aspects of University life, a number of critical governance and leadership actions are necessary. These include:

- The Sustainable Development Committee, chaired by the Chief Operating Officer, will own the climate resilience strategy and associated risk assessment and action plan.
- Adaptation will be embedded as part of the institutional risk register.
- Annual reporting on adaptation, both internal and external, will be enhanced.
- A series of adaptation-focussed KPIs will be developed as part of Aberdeen 2040.
- Identify positive linkages with the 2040 Net Zero Strategy.

Health and wellbeing are an integral component of working and learning at the University and our changing climate presents a growing risk to this area.

All members of our University community, whether they work indoors, outdoors, or travel significantly as part of their role, are increasingly vulnerable to disruption, risk of injury, or to potential negative mental health consequences from climate change impacts:

- Sun exposure and overheating during the summer months impacting mental and physical health and labour productivity.
- Flooding of sports pitches following storms or extended periods of rain leading to temporary closures and cancellation of sports events.
- Risk of physical and/or mental isolation e.g., due to flooding or storms.
- Falling branches from trees due to storms or drought in the summer months.
- Physical injury as part of reactive maintenance work following flooding or storms.

The University has already taken several steps to help mitigate these impacts:

- Adjusting work priorities for Grounds and Cruickshank Botanic Garden (CBG) staff in the summer months to focus on activities in cool locations and to avoid the hottest periods of the day.
- Monitoring of weather forecasts for storms or flooding to inform the safety requirements and procedures for recovery and clean up teams.
- Issuing appropriate uniforms and PPE for grounds staff i.e., that are breathable and focused on cooling/heat protection for summer work.
- Regular tree surveys to identify at risk areas.
- The University also has an in-house counselling team, available to both staff and students, that is keen to explore climate related impacts and the support it can offer.

To further enhance our climate resilience in the health and wellbeing of our staff and students, the University will consider the following activities:

- Development of educational materials and learning opportunities to enhance the knowledge levels of both staff and students (as part of other sustainability training).
- Enhancement of current emergency management plans (EMP) to include climate resilience and climate related event scenarios.
- Review current working procedures to ensure the current and future climate change risks to staff and students are understood. Focus areas to include personal protection equipment (PPE), drinking water availability, and e.g., climate risks assessments for student excursions and field trips.
- Develop an understanding of the financial implications of climate change.
- Review the University's counselling service to see how it can offer support in areas such as climate anxiety, and the social and physical isolation that may occur due to climate change.

4.2. Estates & Operations

The University of Aberdeen has three main sites across Aberdeen, with a number of satellite facilities farther afield.

Our Old Aberdeen campus brings together the ancient and modern, with historic facilities such as the King's College Chapel, sharing a site with ultra-modern facilities such as the Science Teaching Hub and the Sir Duncan Rice Library.

Our medical campus at Foresterhill is shared with NHS Grampian's Aberdeen Royal Infirmary complex, with integrated and independent clinical, research, and teaching facilities providing high quality health services, education and research.

Our Hillhead Student village is the University's principal accommodation site with capacity for up to 2,000 students. With a mix of standard and en-suite rooms and flats, and onsite retail and laundry facilities, the village is the hub for most incoming students.

We also maintain a variety of grounds and greenspaces across our estate - from highly maintained lawns, grass verges and floral displays to extensive playing fields, as well as hosting the UK's most northerly botanic garden. The latter, our 11-acre Cruickshank Botanic Garden (CBG), is a key nature-based educational resource.

As a result of the nature, location and age of our estate, the University has experienced a number of climate-based challenges in recent years, with the impact of named storms in particular causing extensive damage (with examples of the damage caused shown in the images on p2). At a regional level such impacts have been acutely felt, with Storm Arwen's 100 mph winds in 2021 severely impacting Aberdeenshire's Haddo House estate, which lost to 500,000 trees according to BBC reports. Closer to home on campus, impacts have included:

- Surface water flooding after heavy or prolonged periods of rain, often leading to water ingress and damage to buildings and related infrastructure, and flooding of sports pitches.
- Increased incidences of buildings overheating during the summer and in heatwaves.
- Damage to buildings and trees across all sites, including in the Cruickshank Botanic Gardens, during storms and high winds.

As some of these impacts have been evident to some degree for several years, colleagues in Estates & Facilities (E&F) already have in place several coping activities, procedures and responses to deal with adaptation situations as and when required. These include:

- Restricting access to high-risk areas e.g. Cruickshank Botanic Gardens, during and following storms to protect staff, students, and the public from injury.
- Maintaining sandbag stores and submersible pumps as protection against, and response to, water ingress in flooding prone buildings.
- Regular gutter and roof maintenance and clearing to ensure buildings can withstand heavy or prolonged periods of rain without water ingress or flooding.
- Temporary fans and cooling measures to enable the use of buildings/locations during heat waves.
- Dedicated portable pumps to remove flooding from sports pitches.
- Cutting grass to a higher height to improve moisture retention.

To further enhance our climate resilience in this area, the University will explore the following activities in the months and years ahead:

- Explore mechanisms for conducting formal flooding, overheating, and wind/storm damage risk assessments.
- Embedding climate change adaptation as part of the core design principles of future new-build and refurbishment projects, ensuring that our estate is designed for the evolving climate.

- Explore strategic landscaping opportunities to reduce flood risk e.g. exploring the applicability of drainage techniques like e.g., Sustainable Urban Drainage Systems (SUDS) schemes.
- Enhance preventative building and greenspace maintenance programmes, e.g., increase gutter cleaning frequency and the active watering of trees during the summer.
- Investigate potential changes to lawn seed mixes to incorporate more drought resistant species such as clover.

4.3. Learning, Teaching & Research

How and what we teach and research, is constantly evolving as we react to the changing world around us. The intellectual curiosity that drives our academic endeavours must also extend to our approach to climate resilience and to enabling our transition to becoming a more resilient institution that can withstand the coming changes to our environment.

Disruption caused by climate impacts have the potential to impinge on aspects of our core purpose i.e., the delivery of world class education and the pursuit of cutting-edge research. In addition to the impacts highlighted in Section 4.2, the University anticipates a number of potential climate-based challenges to its learning, teaching, and research:

- Delays to operational, teaching and research activities due to the weather, such as high winds, heavy rainfall, and heatwaves.
- Issues with access to University sites due to external transport and drainage infrastructures being overwhelmed by weather events, such as trees coming down on roads during high winds and roads becoming flooded.
- Areas of buildings and campuses not being accessible by staff and students due to flooding, impacting teaching, research, and operations.
- Costs associated with preventative and reactive maintenance measures.
- Disruption to supply chains due to extreme weather.

As we have been experiencing some of the effects of climate change for several years, we already have a selection of mitigation activities and procedures in place:

- Communication procedures to ensure schools and directorates are aware of any blocked roads/routes.
- Monitoring of weather forecasts to inform any communications with impacted individuals or grounds, and any outside or reactionary activities.
- Remote working and teaching facilities for staff and students available where needed.
- Emergency Management Plans to provide guidance for managing key events with regards to the estate to ensure minimal impact on teaching and research.

To further enhance our climate resilience in this area, the University will continue to support communications and remoting working facilities, while also embedding adaptation in emergency planning and progressing with the measures detailed in Section 4.2.

4.4. Partnership & Engagement

As one of the region's largest public bodies and with a substantial civic responsibility as well as a statutory duty, the University has a vested interest in being an integral part of the regional and national response to climate change adaptation.

As such, we intend to use our relationships with Aberdeen City Council, Aberdeenshire Council, and NHS Grampian [16] to identify synergies and areas of collaboration between their adaptation strategies and ambitions, and our own. In some cases, this may be by taking advantage of the academic expertise at our disposal to assist in the development of regional responses.

Aberdeen City Council's adaptation framework, "Aberdeen Adapts" [17], and Aberdeenshire Council's "Climate Ready Aberdeenshire" [18] strategy identify a series of climate change related challenges facing the region. These include but are not limited to:

- The productivity of our agriculture and forests
- The occurrence of pests and disease
- The quality of our soils
- The health of our natural environment
- The security of our food supply
- The availability and quality of water
- The increased risk of flooding
- The change at our coast
- The resilience of our businesses
- The health and wellbeing of our people
- Our cultural heritage and identity
- The security and efficiency of our energy supply
- The performance of our buildings
- The network connectivity and interdependence of our infrastructure

As part of this strategy, we commit to playing a pro-active role in the development of regional and national responses to climate change, harnessing our academic expertise where appropriate, and working collaboratively to resolve operational challenges wherever practicable.

4.5. Harnessing Potential Benefits and Opportunities

While climate change will have negative impacts on both the University and the region, we should also be alert to potential opportunities these changes may present for the University. As a research-intensive University, the anticipated changes to our climate and the consequences for our environment, agriculture, digital and physical infrastructure, present significant potential for related research and teaching.

There are also potential synergies between our adaptation responses and the University's Net Zero Strategy, where projects and actions have the potential to contribute to both.

With average annual temperatures expected to increase over the coming years, our greenspaces could also play an important role in a number of ways:

- Improving the physical and mental health of our staff and student communities through increased opportunities for outdoor activities and contact with nature.
- Reducing the cooling loads of our buildings by combating the heat island effect
- Reduction in flooding risks through the development of Sustainable Urban Drainage Systems schemes which utilise native planting to provide co-benefits for biodiversity
- Provide a source of data for research and teaching on the changing species of plants, pests, animals, etc. as climate change progresses over the coming decades, especially the Cruickshank Botanic Gardens.

At a practical, operational level, projects like rainwater harvesting provide an opportunity to take advantage of the predicted rainfall increase and combat the impact of water shortages, while reducing freshwater consumption and related emissions.

As we enhance our understanding of climate change and improve the resilience of our estate and operations, it is anticipated that further benefits and opportunities will be identified.

4.6. Sustainable Development Goals

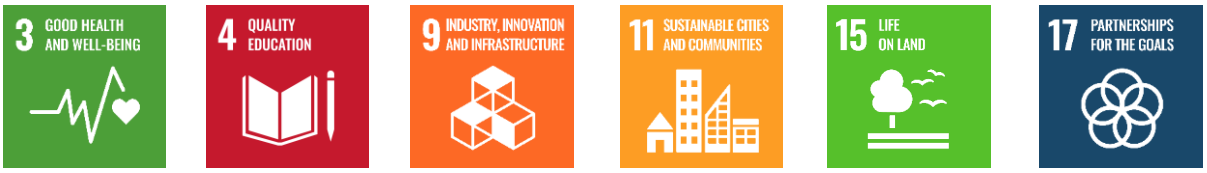
The United Nations (UN) Sustainable Development Goals (SDGs) were created in 2015 as a global call to action to end poverty, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity.

The SDG framework represents a complex and inter-connected matrix of societal challenges from climate change to social and economic inequality, public health and well-being to the nature and biodiversity emergency. It is acknowledged that action in one area will necessarily affect outcomes in others, and that development must balance social, economic, and environmental sustainability. [19]

Figure 4-1: Sustainable Development Goals

As part of our Aberdeen 2040 strategy, we embraced the SDG framework as a compelling way of articulating where our research, educational and operational activities were having a positive impact on this globally shared set of goals. To that end, as with our Net Zero Strategy, we intend to map the actions we take as part of this Adaptation Strategy against one or more of the SDGs.

With their focus on tackling public-health challenges, innovating in our response to climate risk, ensuring the long-term sustainability and resilience of our campus community, making best use of our grounds and greenspaces (including enhancing the biodiversity they support), and the emphasis on working collaboratively in partnership, we anticipate that most of our adaptation actions will correspond to one or more of the following SDGs:



5. Tracking and Reporting Our Progress

A key component of Adaptation is ensuring that progress, positive or negative, is consistently and transparently monitored and reported in a suitable format.

A climate change risk assessment, and action plan have been developed to sit alongside this strategy, identifying current practices and future actions to improve the University's resilience.

The action plan has been developed to reflect the Climate Adaptation Capability Framework[1]. The framework was developed by Adaptation Scotland, on behalf of the Scottish Government, and aims to provide Scotland based organisations with a shared mechanism against which to gauge their progress in embedding action to tackle adaptation.

The risk assessment and action plan will be reviewed by the Sustainable Development Committee on a two-year cycle, with progress against the Adaptation Scotland Capability Framework tracked and updated where applicable.

Figure 5-1: Adaptation Scotland Capability Framework

Activities and progress will be reported externally through the University's statutory annual report to the Scottish Government under the Public Bodies Climate Change Duties.

The University will also continue to engage with and share learnings with both the relevant sectoral and regional networks, including EAUC Scotland, the Public Sector Climate Action Network, and through stakeholder engagement e.g. with the relevant local authorities.

[1] A summary of the framework is included in the action plan document.

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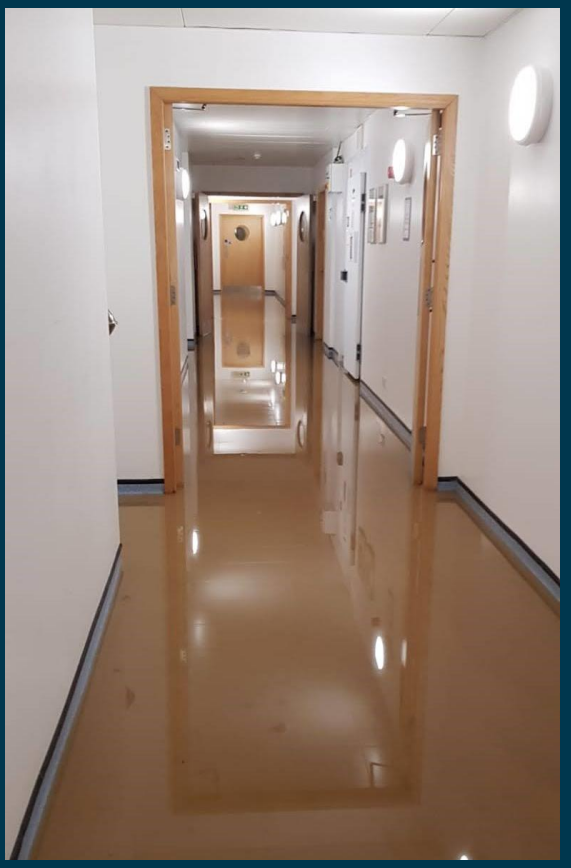
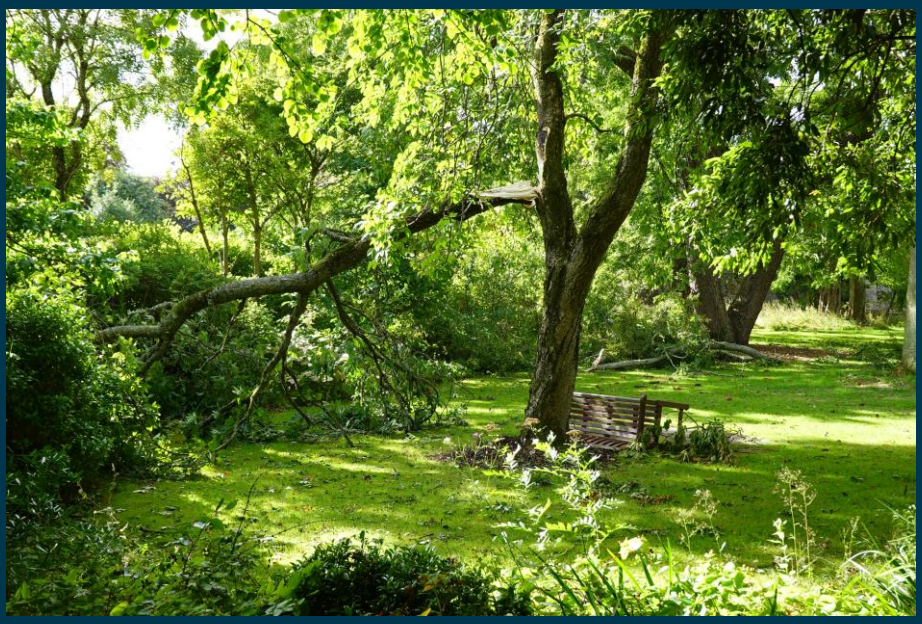
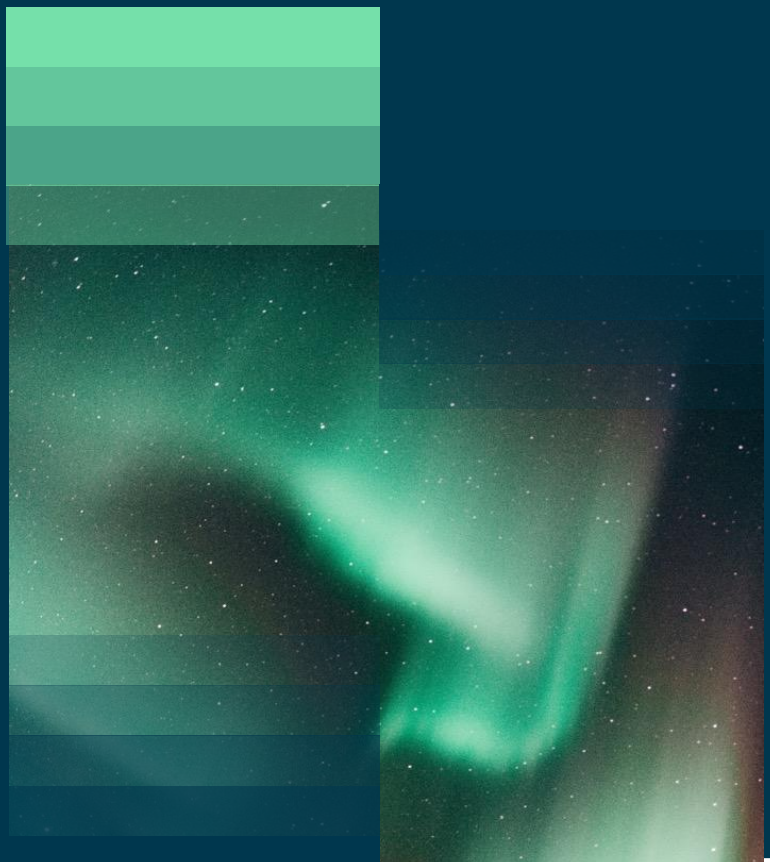




Appendix A: Climate Projections



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Appendix A: Climate Projections

When evaluating the potential future changes to our environment that climate change may cause, researchers use four Representative Concentration Pathways (RCPs) to articulate different scenarios. RCPs make predictions of how different concentrations of greenhouse gases in the atmosphere will change in future as a result of temperature increases because of human activities.

RCP	Change in Temperature (°C) by 2100 [13]	Description [8]
RCP2.6	1.6 ± 0.4	Also known as the "Low Emissions Scenario", this RCP assumes sustained, rapid reductions in greenhouse gas emissions globally. The projections for this scenario represent the minimum level of climate change we are likely to experience.
RCP4.5	2.4 ± 0.5	Also known as the "Medium-Low" and "Medium-High" scenarios, these RCPs represent two medium stabilised pathways with varying degrees of successful mitigation.
RCP6.0	2.8 ± 0.5	
RCP8.5	4.3 ± 0.7	Also known as the "High Emissions Scenario", this RCP represents the most extreme changes if greenhouse gas emissions continue to increase, and emission reduction targets are missed.

The mapping and location specific scenarios shown below show the RCP8.5 data or the so-called 'High Emissions Scenario'.

Sea Levels [20]

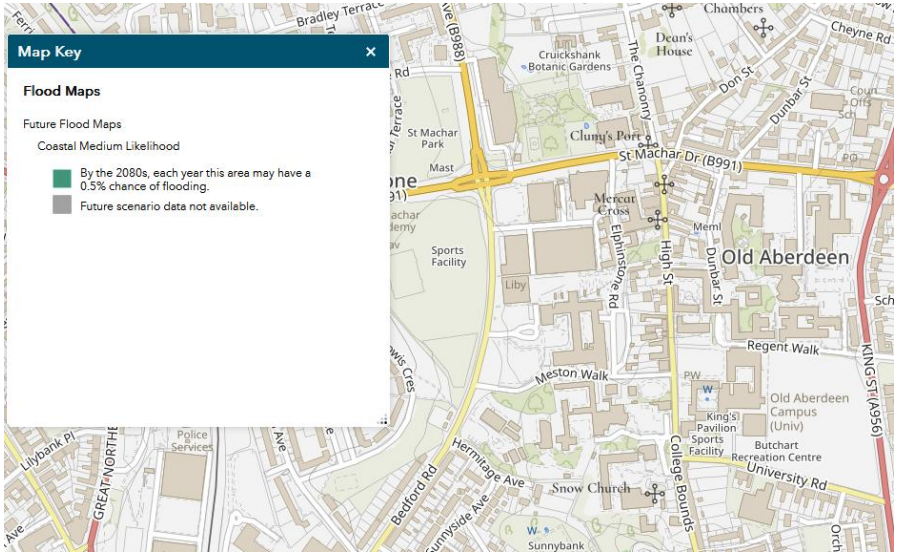

Figure 6-1: SEPA 2080 Sea Level Projection - Old Aberdeen

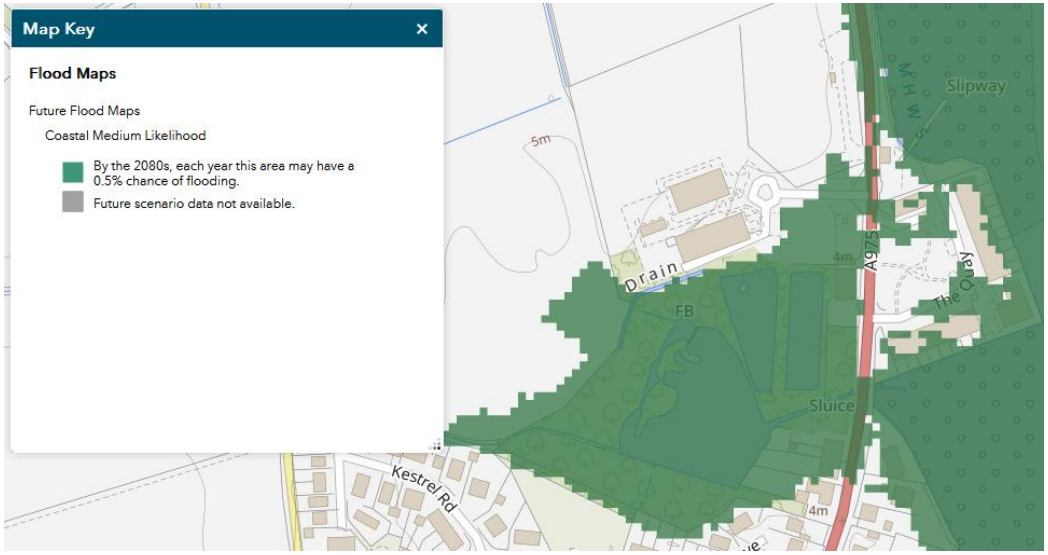

Figure 6-2: SEPA 2080 Sea Level Projection - NDC

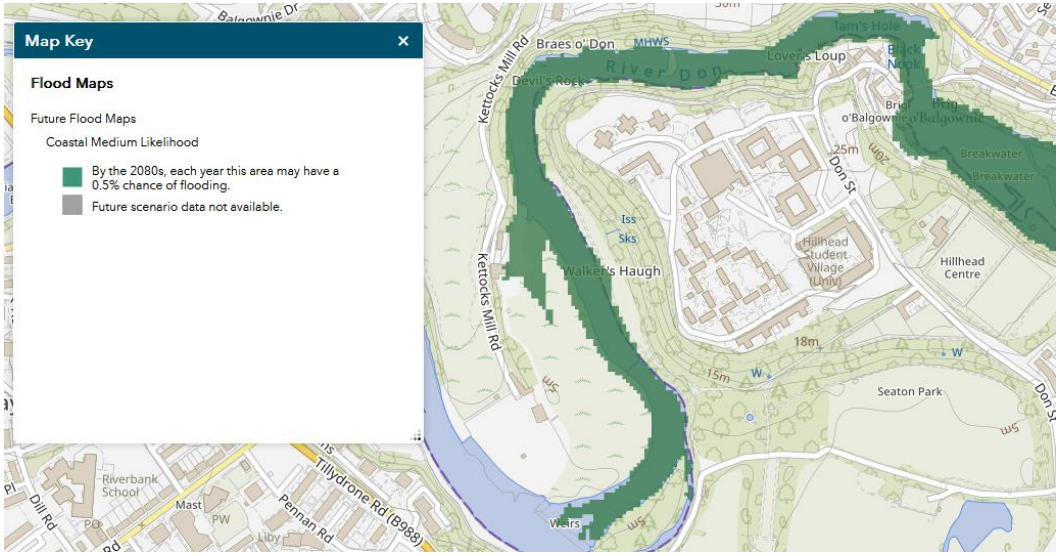

Figure 6-4: SEPA 2080 Sea Level Projection - Hillhead

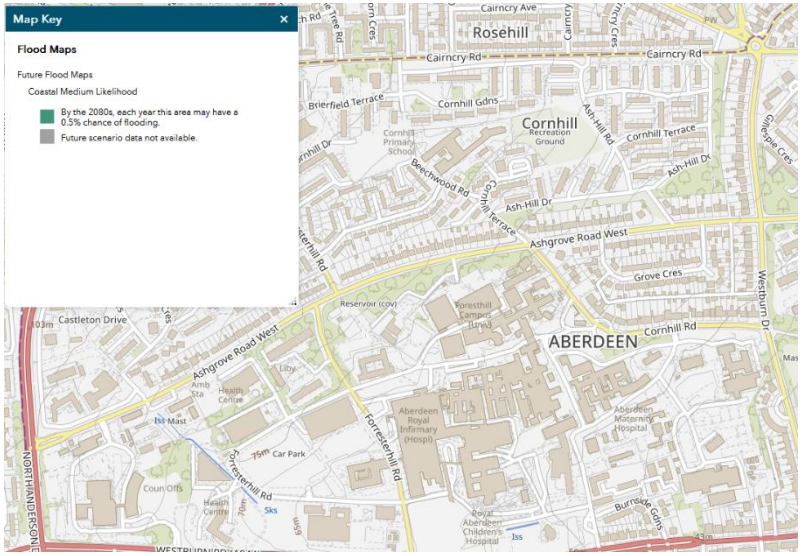

Figure 6-3: SEPA 2080 Sea Level Projection - Foresterhill

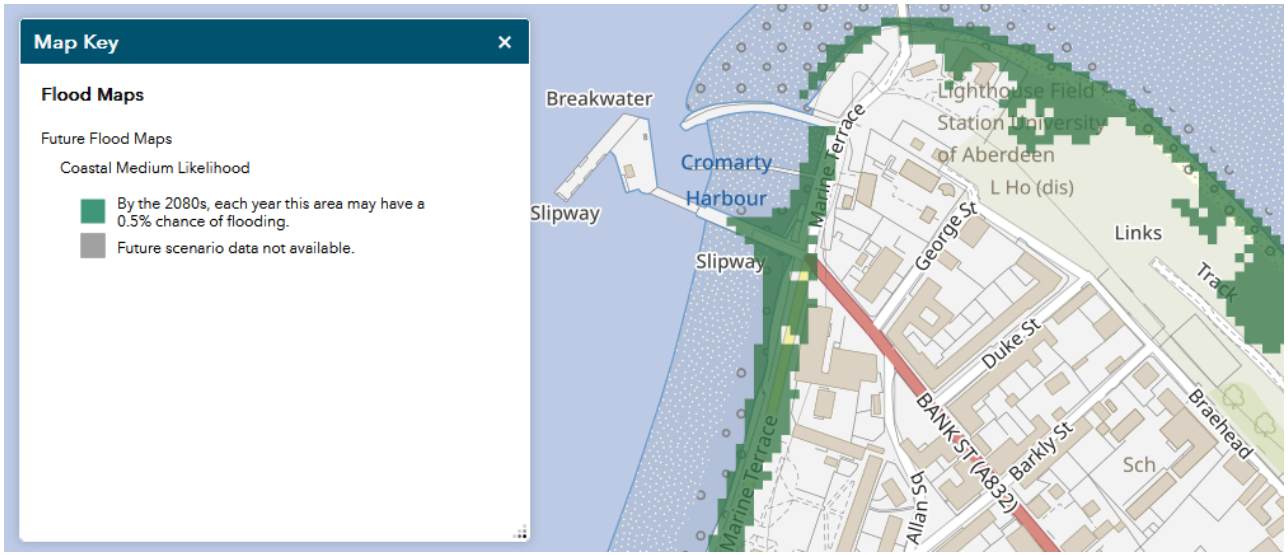

Figure 6-5: SEPA 2080 Sea Level Projection - Cromarty

Flooding Patterns (Rivers, Surface Water and Small Watercourses – excl. Coastal) [20]

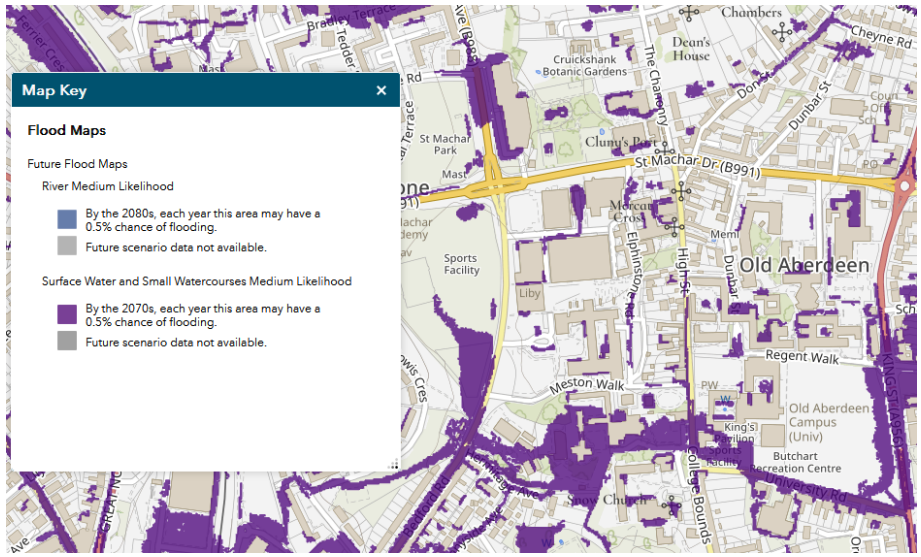

Figure 6-7: SEPA 2080 Rivers & Surface Water Level Projections - Old Aberdeen

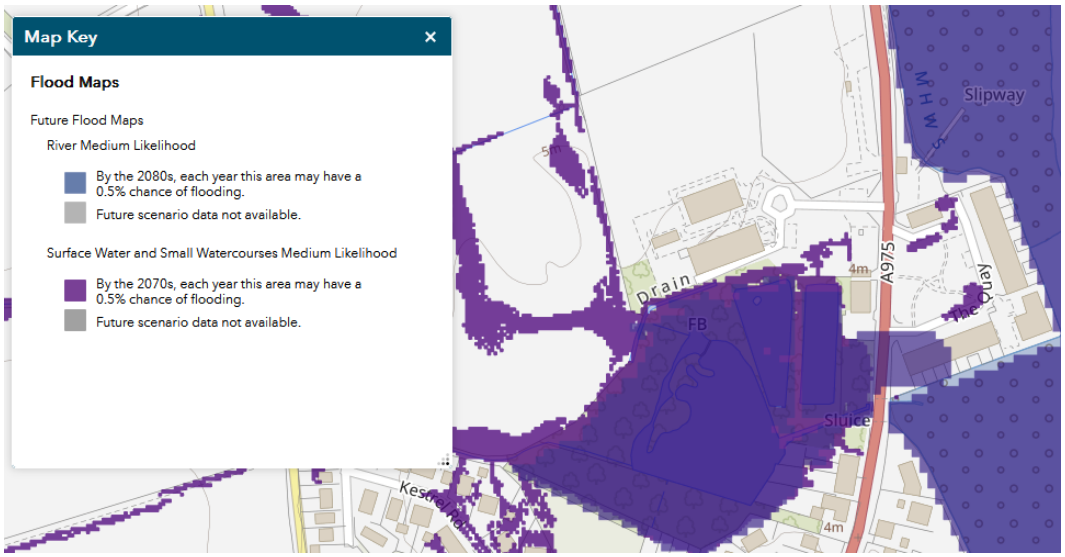

Figure 6-6: SEPA 2080 Rivers & Surface Water Level Projections - NDC

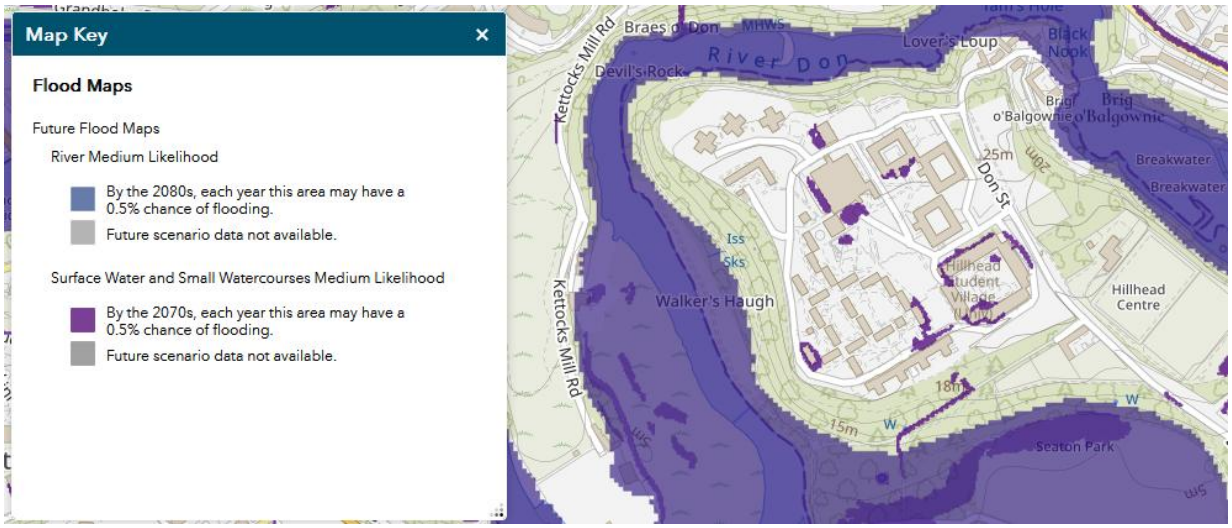

Figure 6-9: SEPA 2080 Rivers & Surface Water Level Projections - Hillhead

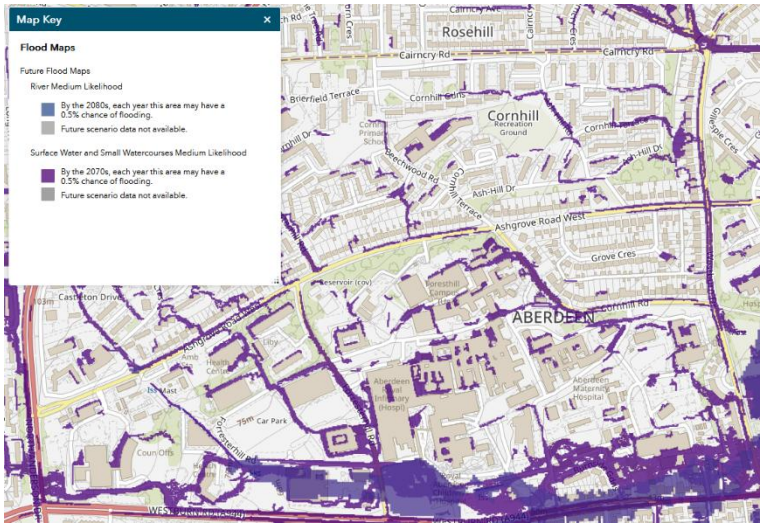

Figure 6-8: SEPA 2080 Rivers & Surface Water Level Projections - Foresterhill

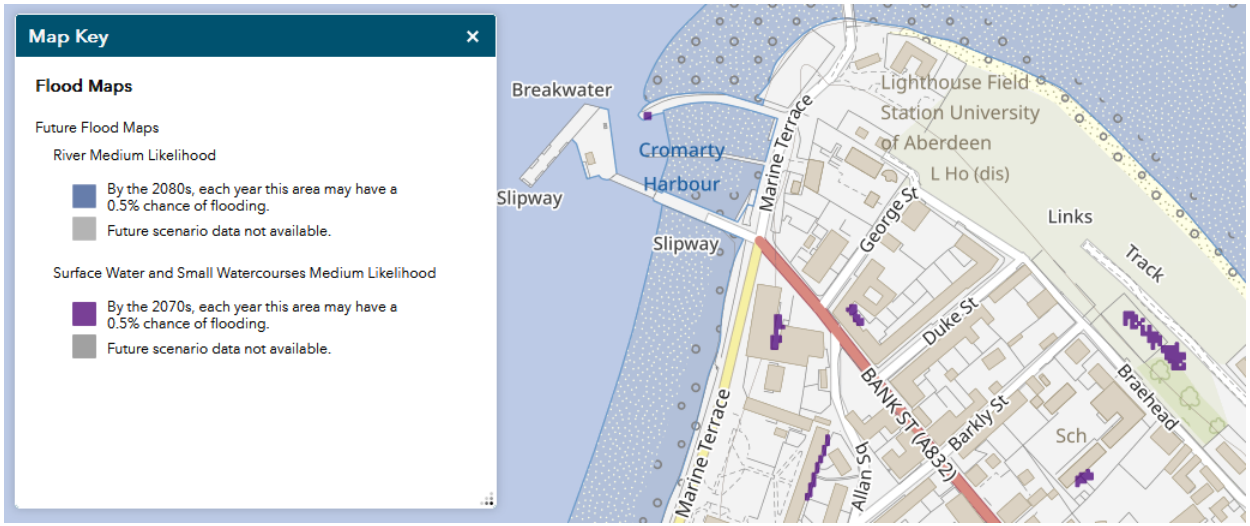

Figure 6-10: SEPA 2080 Rivers & Surface Water Level Projections - Cromarty

Rainfall [21]

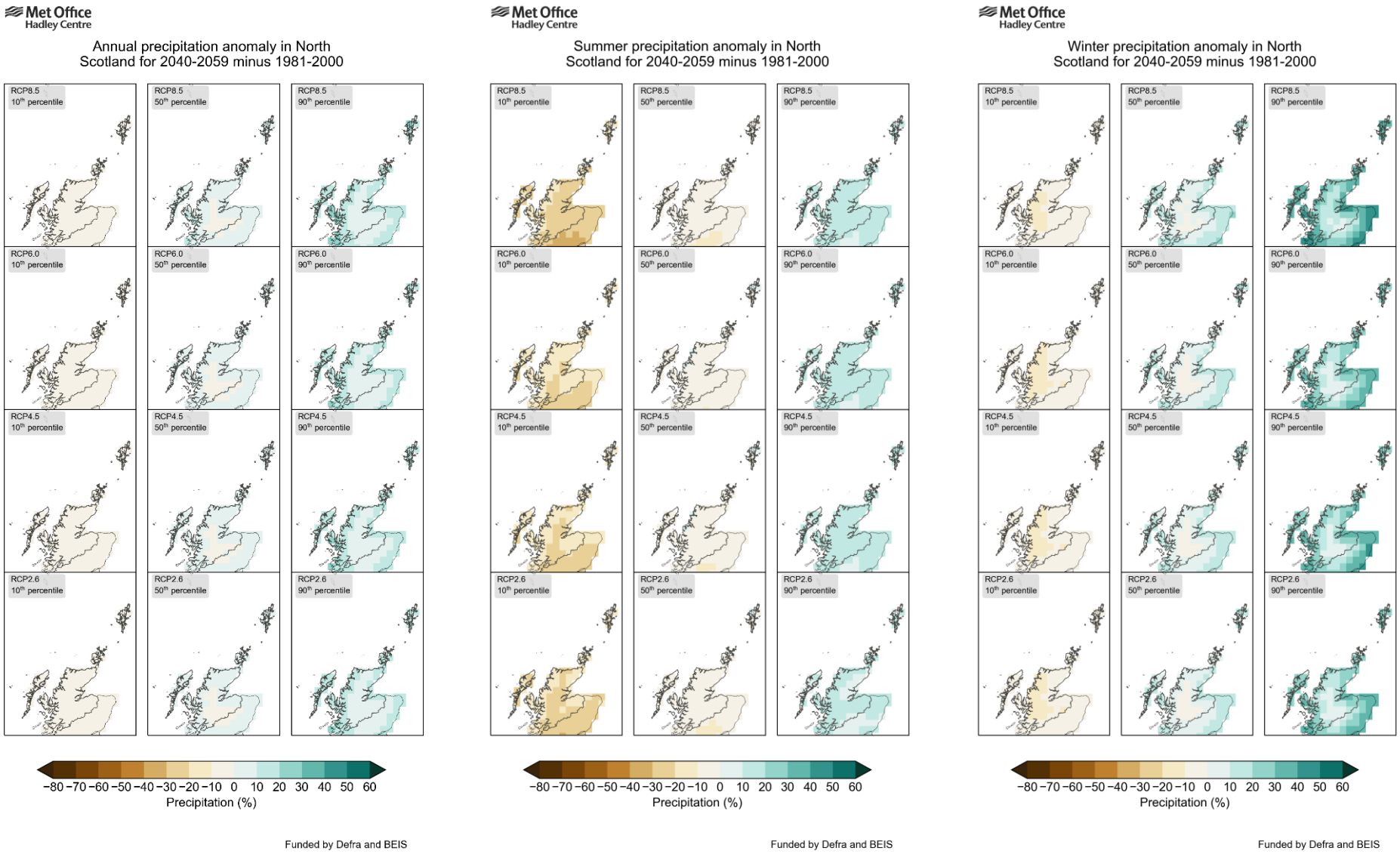

Figure 6-11: Projected Changes to Rainfall Compared to 1981 - 2000 (All RCPs)

Temperatures

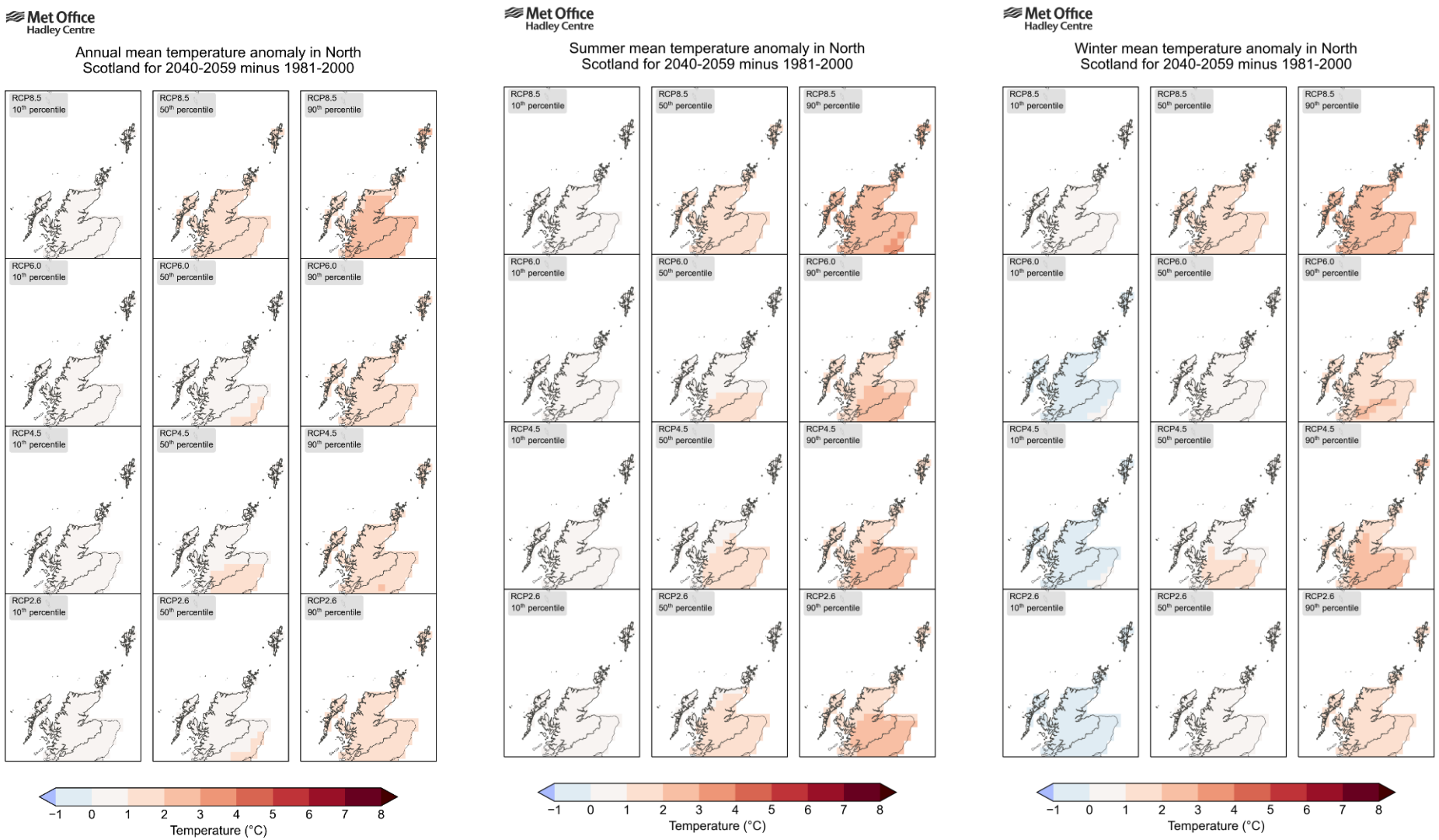

Figure 6-12: Projected Changes to Mean Temperatures Compared to 1981 - 2000 (All RCPs)

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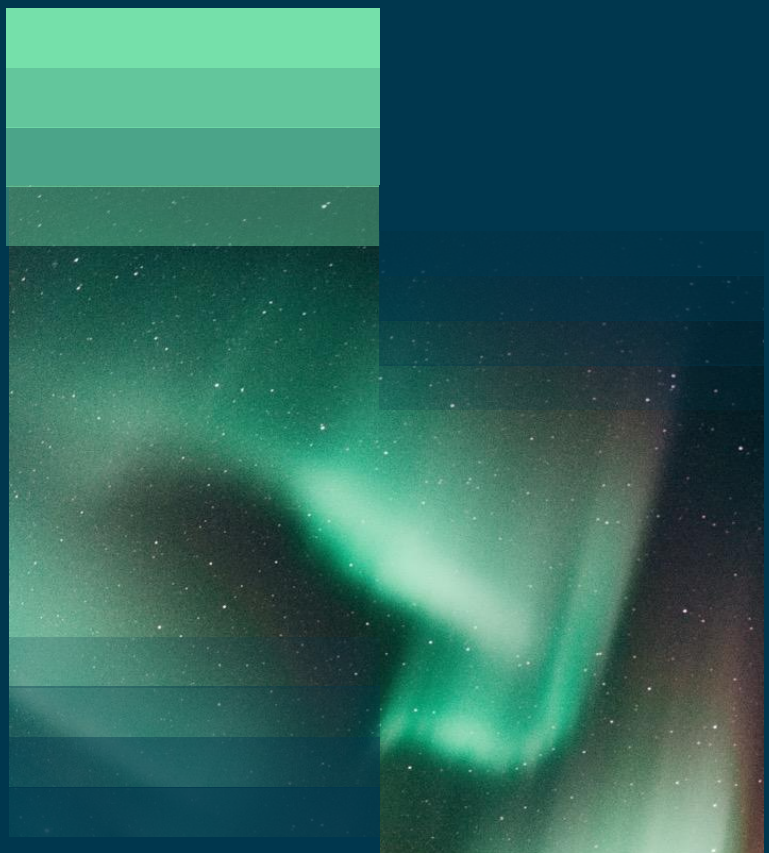

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