

Adaptation Scotland

supporting climate change resilience

Adapting to Climate Change Leading role for universities and colleges

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EAUC-S Conference | 22 February 2017

The Adaptation Scotland programme is funded by the Scottish Government and delivered by sustainability charity Sniffer.





**Enabling organisations,
businesses and communities
to adapt**

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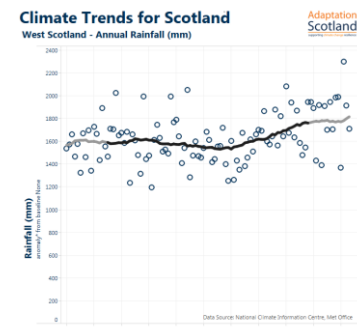
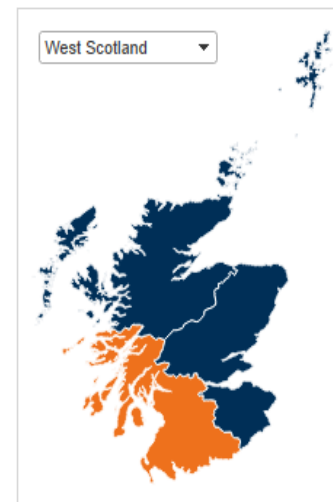
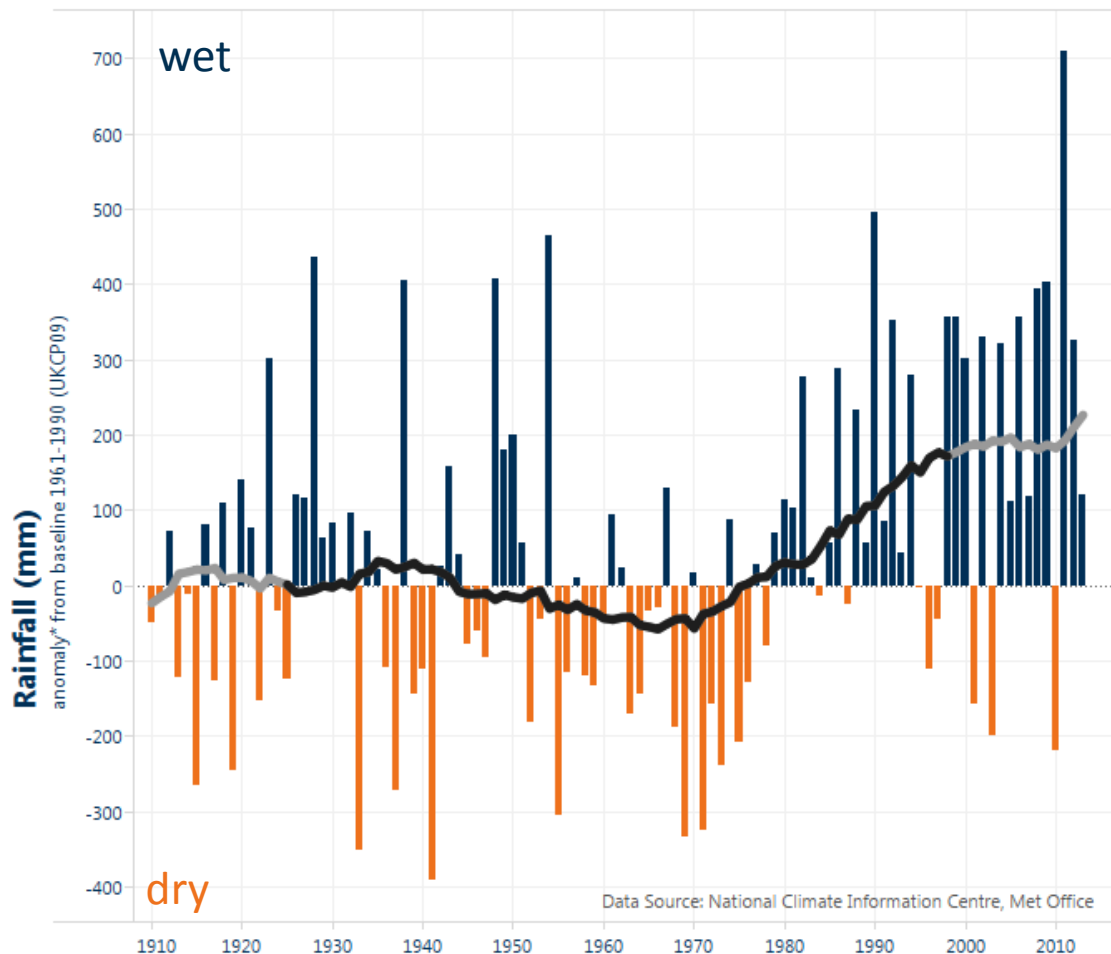
- The challenge
- Impacts
- Response

Scotland's climate is changing...

Climate Trends for Scotland

West Scotland - Annual Rainfall (mm)

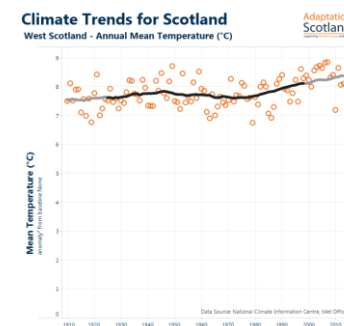
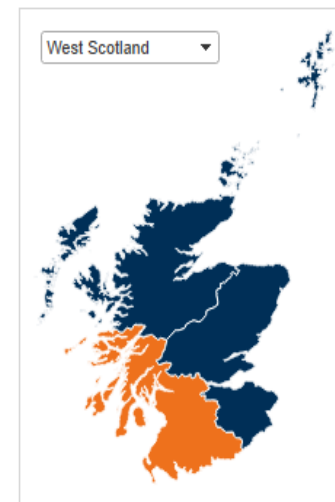
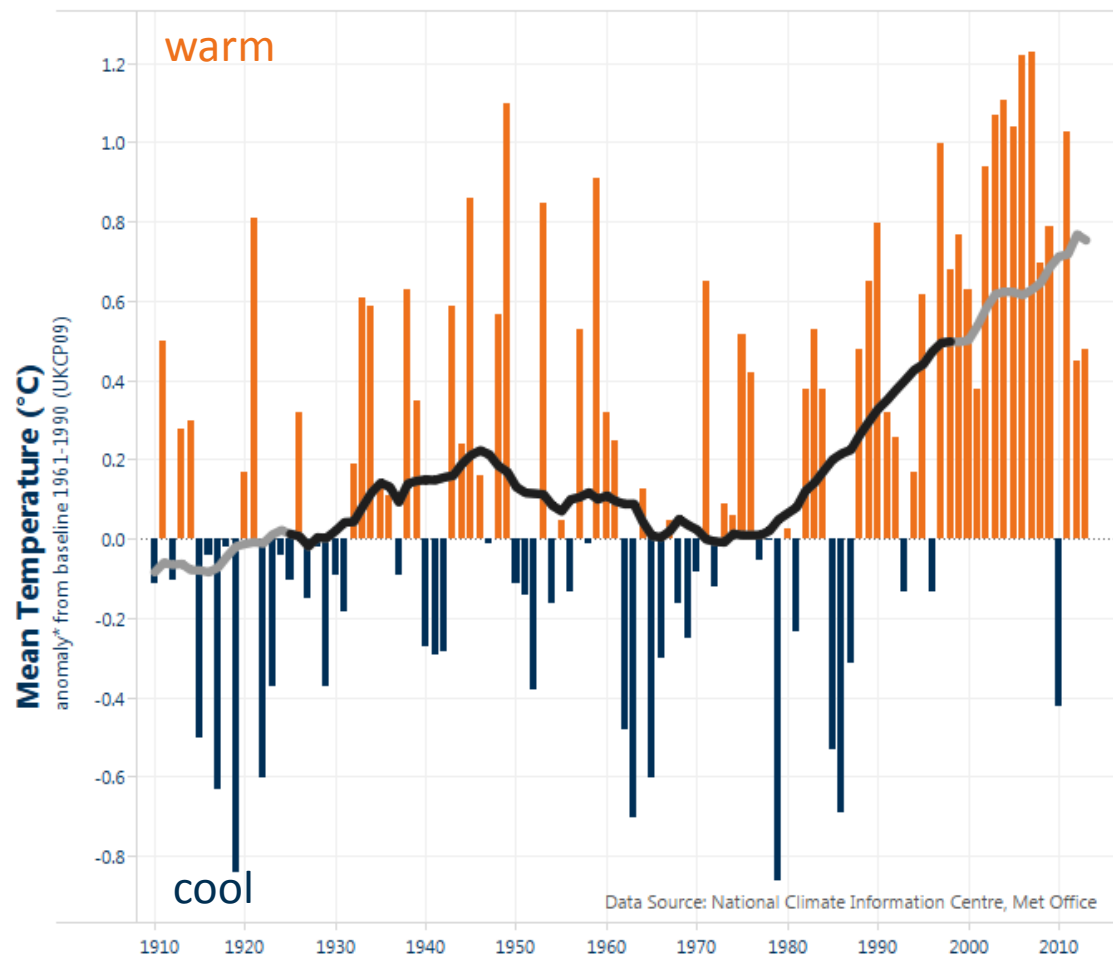
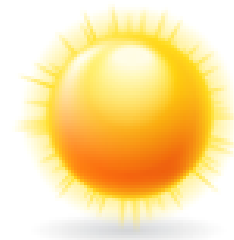
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Climate Trends for Scotland

West Scotland - Annual Mean Temperature (°C)

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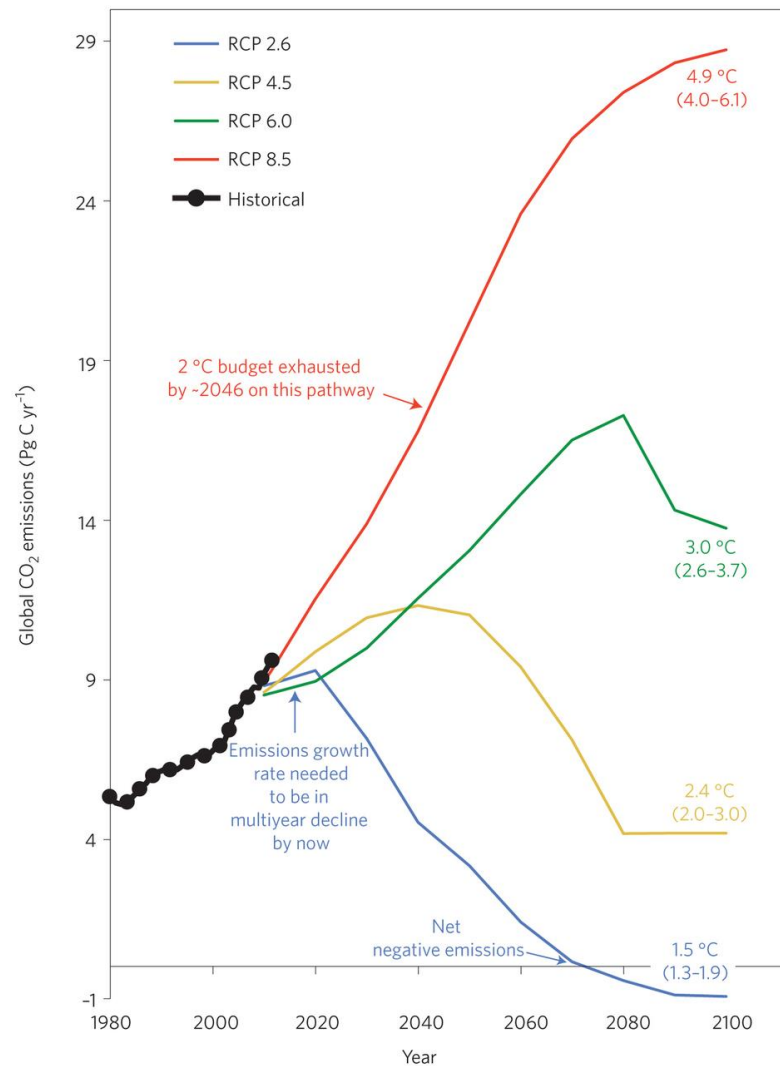


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These changes are projected to continue...

Global CO₂ Emissions



RCP8.5

Figure: Observed and projected trends in global CO₂ emissions under four RCP scenarios.

The climate policy narrative for a dangerously warming world

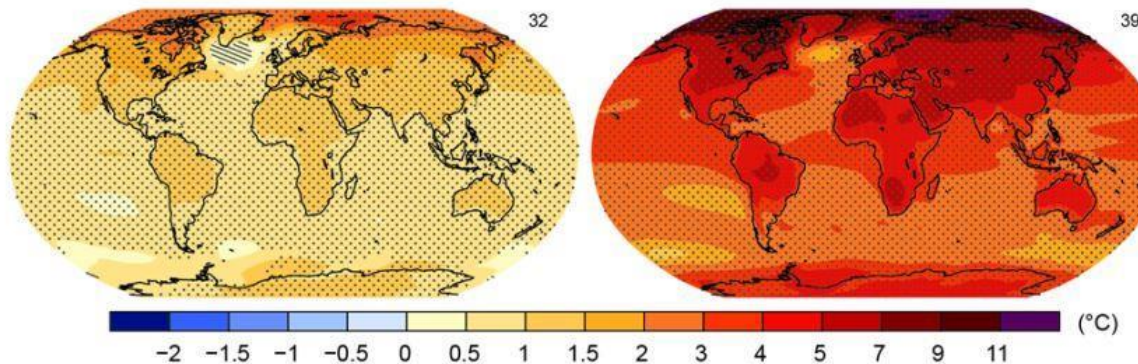
Sanford et al. (2014) Nature Climate Change 4, 164–166
doi:10.1038/nclimate2148

RCP2.6

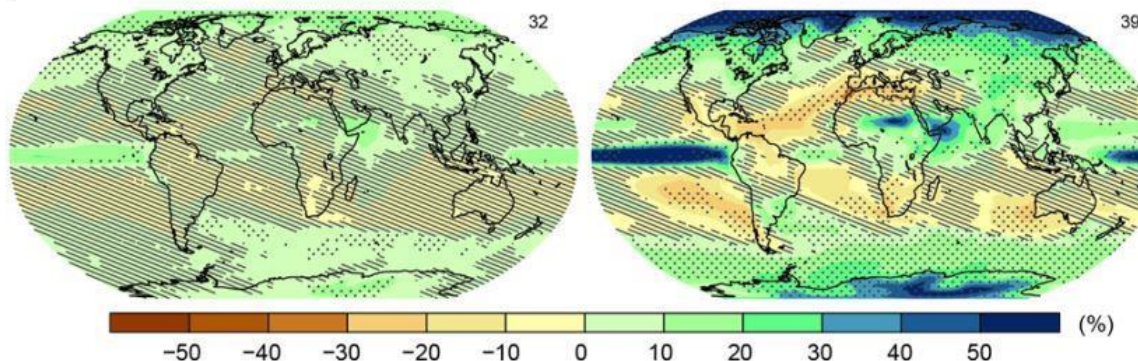
RCP2.6

RCP8.5

(a) Change in average surface temperature (1986–2005 to 2081–2100)



(b) Change in average precipitation (1986–2005 to 2081–2100)



IPCC AR5 Figure SPM.8: Maps of projected late 21st century annual mean surface temperature change, annual mean precipitation change, Northern Hemisphere September sea ice extent, and change in ocean surface pH

Glasgow: Projected Climate Trends

Average temperatures will increase in all seasons (**H**), with the greatest increase in summer (**M**)

What is considered a heatwave or extremely hot summer today will occur more frequently in future (**M**).

Rainfall is projected to become more seasonal, with an increase in average winter and autumn rainfall (**M**). Average summer rainfall may decrease (**L**).

Heavy rainfall events may occur more frequently in winter, spring, and autumn (**M**). An increase in summer heavy rainfall events is uncertain (**L**)

Snow is projected to be less frequent in coastal locations like Glasgow with rising temperature (**H**), although by how much is complicated by increased winter precipitation (**L**).

The growing season will continue to lengthen due to increasing temperatures in spring and autumn (**H**).

Winter storms with extreme rainfall may become more frequent (**L**), although there is large uncertainty in models.

Sea level will rise (**H**).

Assessment of 'Overall Confidence' in scientific evidence for individual statements: High (**H**), Medium (**M**) and Low (**L**).
Note: these are provisional based on in preparation review by ClimateXChange and Adaptation Scotland

The impacts are significant...

15 Key Consequences for Scotland (Scottish Climate Change Adaptation Programme)

The productivity of our agriculture and forests

A warming climate has the potential to improve growing conditions in Scotland and increase the productivity of our agriculture and forestry. However, climate change will also pose a number of threats, from more variable and extreme weather to the spread of pests and diseases, which may limit this potential.



The occurrence of pests and disease

As our climate changes, it will create new conditions that may allow existing pests and disease to spread and new threats to become established in Scotland. This may impact on the health of our people, animals, plants and ecosystems if risks are not properly managed.



The security of our food supply

Climate change may have an impact on global food production. Although Scotland may be able to grow more food, this will not offset the impact global disruption has on us. The effects of increased volatility in the global commodity market due to exposure to extreme climatic events has an impact on supply and cost of food.



The availability and quality of water

As our climate warms and rainfall patterns change, there may be increased competition for water between households, agriculture, industry and the needs of the natural environment. Summer droughts may become more frequent and more severe causing problems for water quality and supply.



The increased risk of flooding

Flooding can already have a devastating effect on those affected. With climate change likely to alter rainfall patterns and bring more heavy downpours, we expect flood risk to increase in the future. This could impact on properties and infrastructure – with serious consequences for our people, heritage, businesses and communities.



The security and efficiency of our energy supply

Climate change may influence Scotland's capacity to generate weather-dependent renewable energy. For example, varying water availability will affect hydro generation schemes. Climate change can also impact power distribution, with impacts ranging from damage caused by extreme weather events, to reduced transmission efficiency occurring as a result of temperature fluctuations. Impacts on global energy markets may also affect energy supplies in Scotland and consequently our overall energy security.



The performance of our buildings

The built environment is made up of existing and newly constructed buildings. Climate change will have an impact on the design, construction, management and use of these buildings and surroundings including the man-made surroundings such as green and blue spaces. Our buildings are largely constructed to cope with the extremes of weather conditions found across Scotland, but most of them will need to continue functioning throughout this century under a significantly different climate. Whether retrofitting existing or building new, it is likely that there will be issues with water management (in flood and drought), weather resistance and overheating.



The health and wellbeing of our people

A warming climate may provide more opportunity to be outdoors and enjoy a healthy and active lifestyle, while reducing mortality in winter. However, it could affect patterns of disease and other health issues. Climate change and associated extreme weather may disrupt the lives of individuals and communities, limiting access to vital services and impacting on people's physical and mental health.



Our cultural heritage and identity

The changing climate is already altering our unique Scottish landscape and threatening our historic environment through coastal erosion, flooding and wetter, warmer conditions. The increased pace of climate change presents challenges to all those involved in the care, protection and promotion of the historic environment.



Infrastructure – Network Connectivity and Interdependencies

Our energy, transport, water, and ICT networks support services are vital to our health and wellbeing and economy prosperity. The effect of climate change on these infrastructure systems will be varied. They are likely to be impacted by an increase in disruptive events such as flooding, landslides, drought, and heatwaves. Our infrastructure is closely inter-linked and failure in any area can lead to wider disruption across these networks.



The quality of our soils

We rely on soils to sustain biodiversity, support agriculture and forestry, regulate the water cycle, have historic environmental and archaeological value, and store carbon. Soils and vegetation may be altered by changes to rainfall patterns and increased temperatures – as well as the way we use the land.



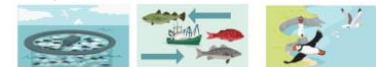
The health of our natural environment

Climate change may affect the delicate balance of Scotland's ecosystems and transform Scotland's habitats and biodiversity, adding to existing pressures. Some distinctive Scottish species may struggle and could be lost, invasive non-native species may thrive, while a degraded environment may not be able to sustain productive land or water supply.



The health of our marine environment

Our marine ecosystems – from plankton through to fish, mammals and seabirds – are already being affected by climate change alongside other pressures, particularly fishing. Changes will continue, with rising temperatures likely to change species and their distributions. The changes will present both threats and opportunities to our commercial fisheries and aquaculture.



The resilience of our businesses

Climate change and associated extreme weather may disrupt transport, energy and communication networks in Scotland and around the world. This could impact on markets, affect supply chains and raise insurance costs.

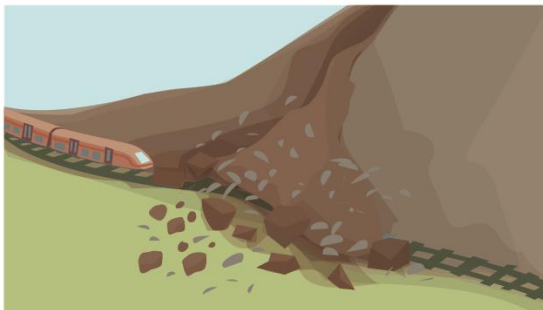


The change at our coast

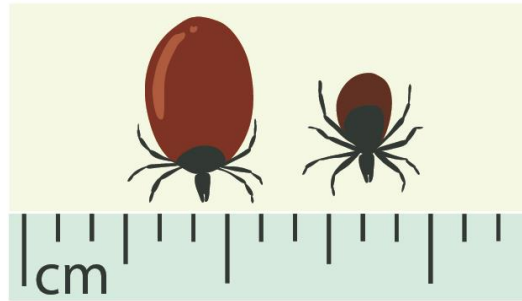
Sea level rise is already having a widespread impact on parts of Scotland's coast. With this set to accelerate over the coming decades, we can expect to see more coastal flooding, erosion and coastline retreat – with consequences for our coastal communities and supporting infrastructure.



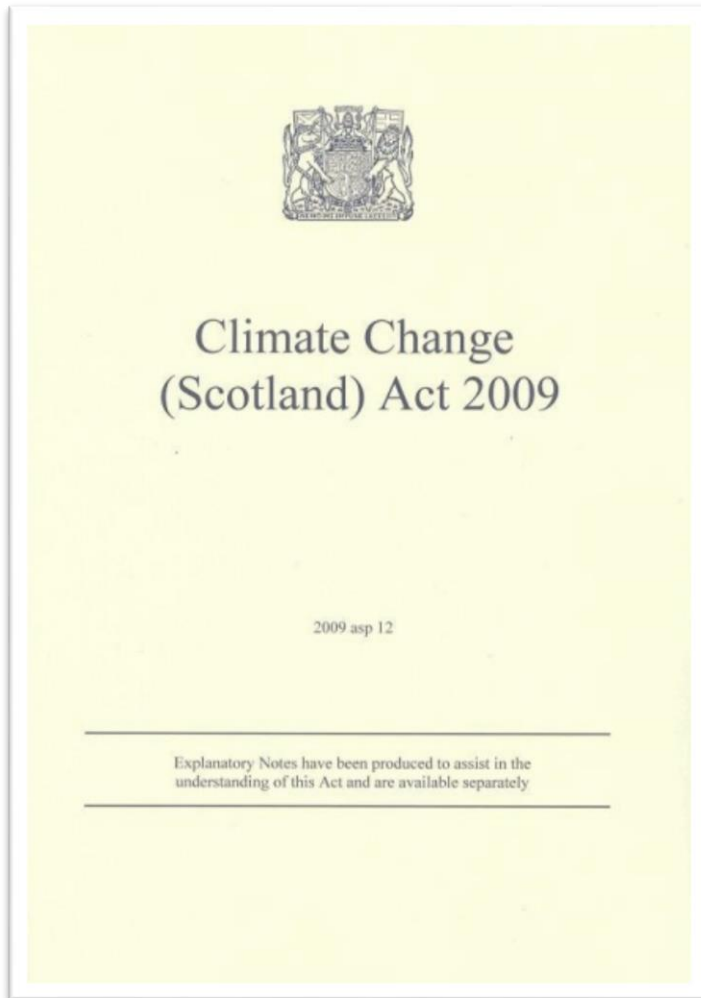




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What is Scotland's response?

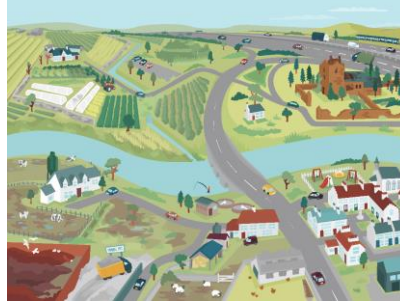


Requires:

- Link to UK Climate Change Risk Assessment (UK Climate Change Act 2008)
- Scottish Climate Change Adaptation Programme
- Bi annual independent assessment of progress
- Public Bodies Climate Change Duties

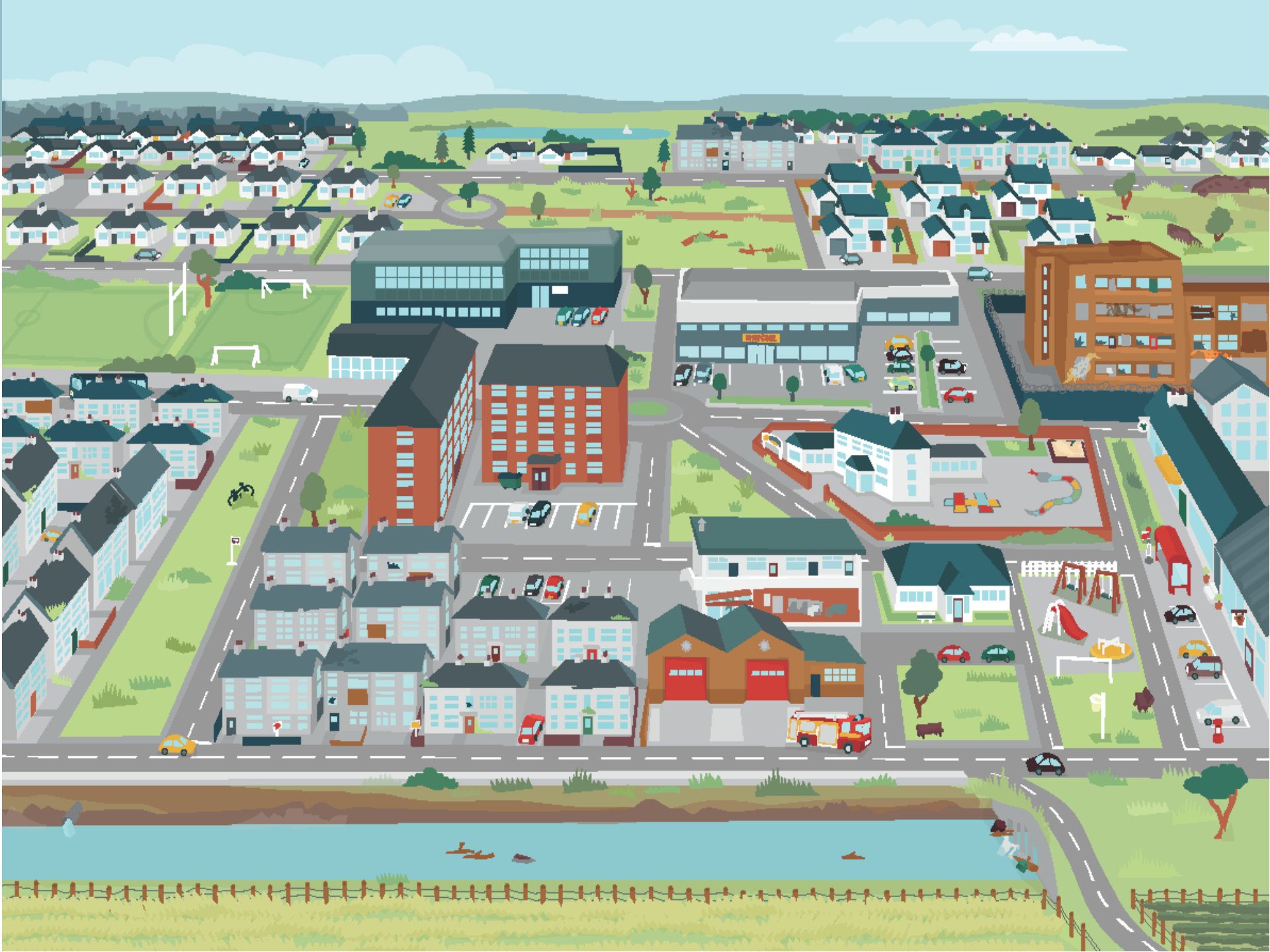
Positive vision for an adapting future

Climate ready places









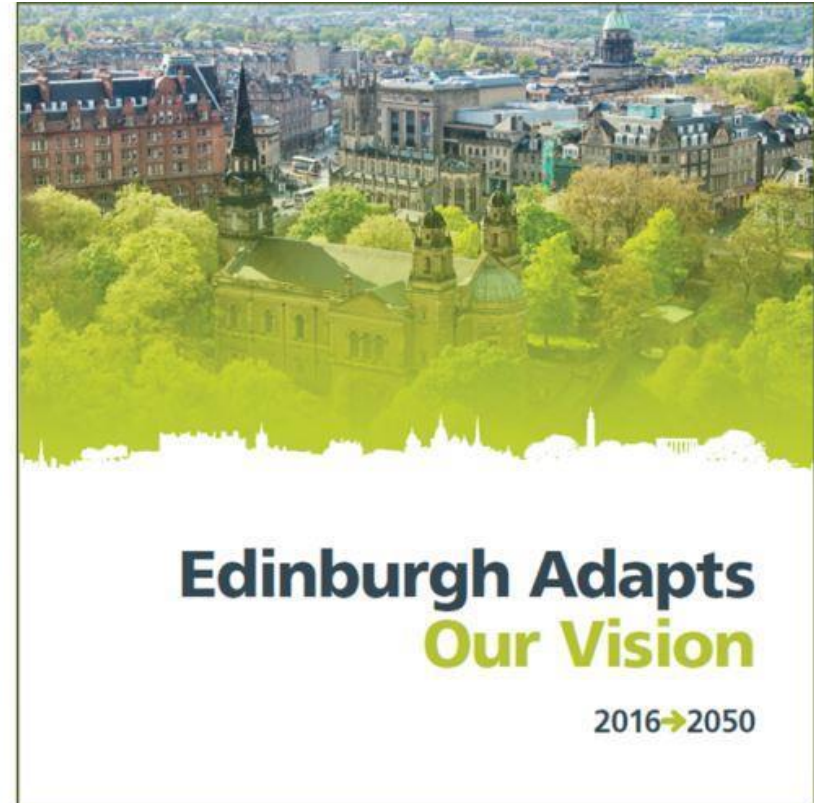
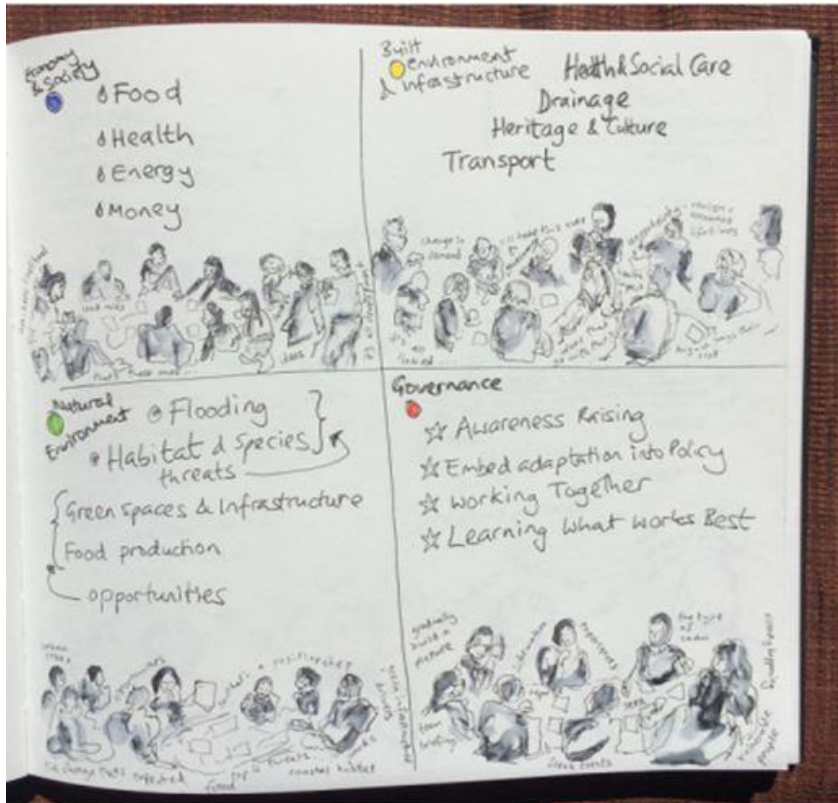


What role for universities and colleges?

- Increasing challenge – local and global impacts are interacting with wider societal challenges.
- Urgent need for research, innovation and action – growth area.
- Enabling legislation and commitment to action make Scotland a ‘hot spot’ for action on climate change.
- Uniquely placed to address intergenerational justice.

Leading change: Edinburgh and Aberdeen

An adapting future

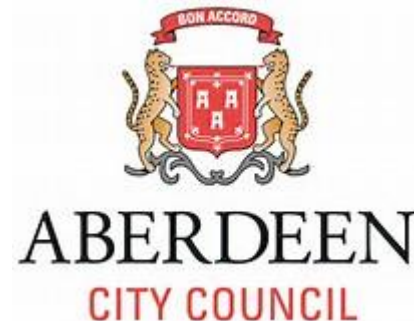


Action Plan

- 50 Partners
- 100 actions



- Competitive selection process for support from Adaptation Scotland. Joint submission from Aberdeen City Council and University of Aberdeen.
- Adaptation Strategy currently under development
- 4 workshops, 40 organisations, 104 participants



3rd European Climate Change Adaptation Conference

Our Climate Ready Future
Glasgow, 5th-9th June 2017

Register Now



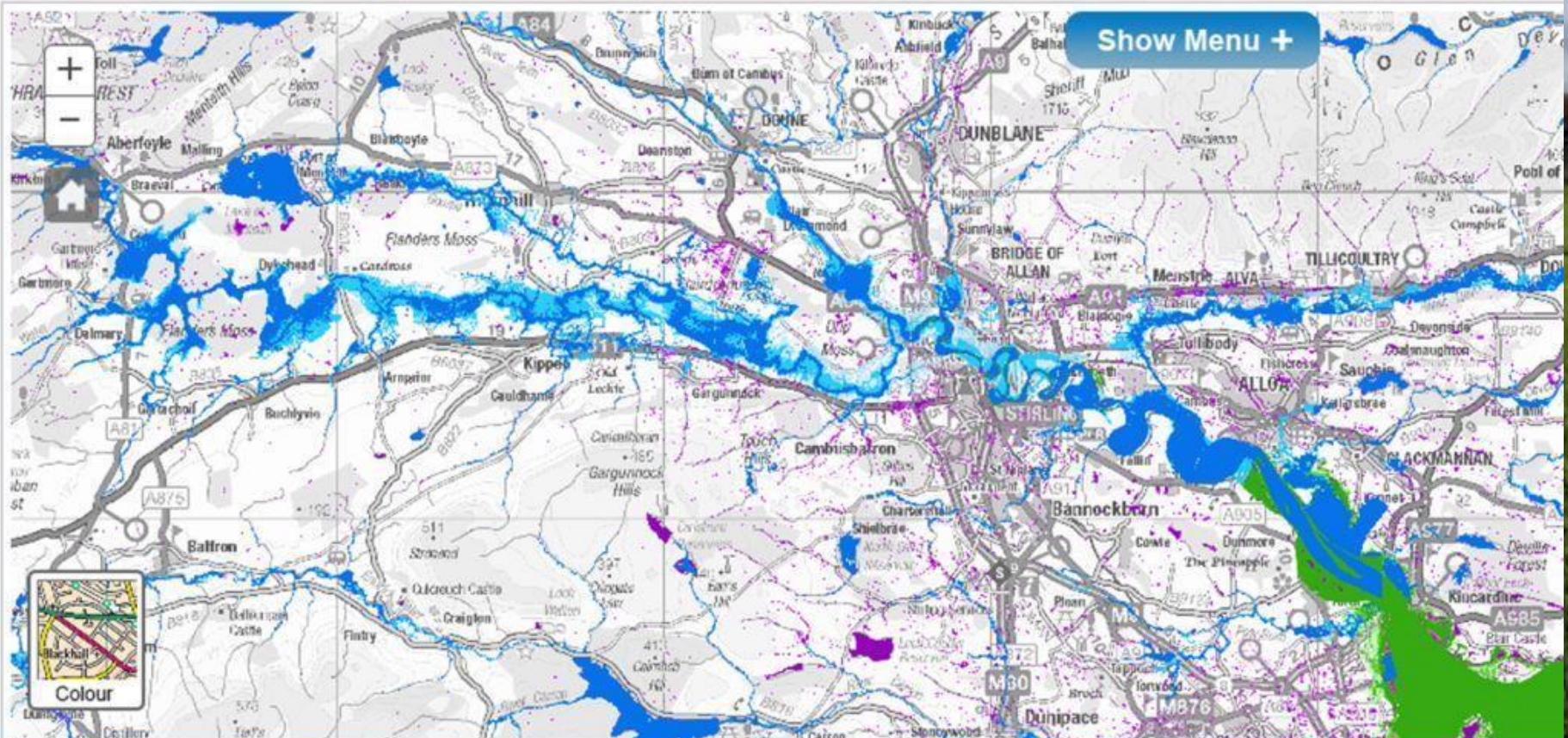
Estates management

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SEPA Home

Flooding Home



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Enhancing student experience



University of Edinburgh Msc Students: Participation in
Policy and Planning – food project

University of Aberdeen Partnership Management MSc

- Scotland's climate is changing and will continue to change
- The Impacts of climate change are far reaching
- Universities and colleges can make significant contributions
- What role will you play?

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www.adaptationscotland.org.uk



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