



Flood Resilience Conference 2026

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Scotland's Flood Resilience Conference 2026

Plenary session welcome

Chair: Jo Kerr, Verture

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The 2025/26 steering group:

Sadiyah Rehman (Scottish Government)

Ruth Flower (SEPA)

Grant Vanson (Edinburgh and Lothians Strategic Drainage Partnership)

Shona Sloan (Scottish Flood Forum)

John Wright (Mott MacDonald)

Pippa Lawton-Van Kuijk (RPA Ltd)

Ben Cooper (City of Edinburgh Council)

Will Burnish (Moray Council)

Susan Veitch (The Highland Council).

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WiFi network:
DELEGATES

WiFi password:
D3L3GATE

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Questions for the conference

What success stories can we build on as we strengthen Scotland's flood resilience?

What more needs to happen to ensure Scotland becomes truly flood resilient?

What actions will you or your organisation do more of or do differently as a result?

What was your standout 'moment of joy' for flood resilience during the conference?

Introduce Yourself to your Neighbour

Who you are

What you're looking forward to at the conference this year

If you're setting any intentions for yourself for the event or for your year ahead

How much flooding you saw on your way to the conference

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Log into a web browser and enter – www.slido.com and enter Floodresilience2026 in the box with 'enter code here'

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Policy and Practice Updates

Kirstin Leath

Scottish Government

Policy and Practice Updates

Catriona Laing

Scottish Government

SEPA Flood Risk Management Planning Cycle 3

Andrea Johnstonova

SEPA



Scottish Environment
Protection Agency
Buidheann Dian
Àrainneachd na h-Alba

For the future of our environment

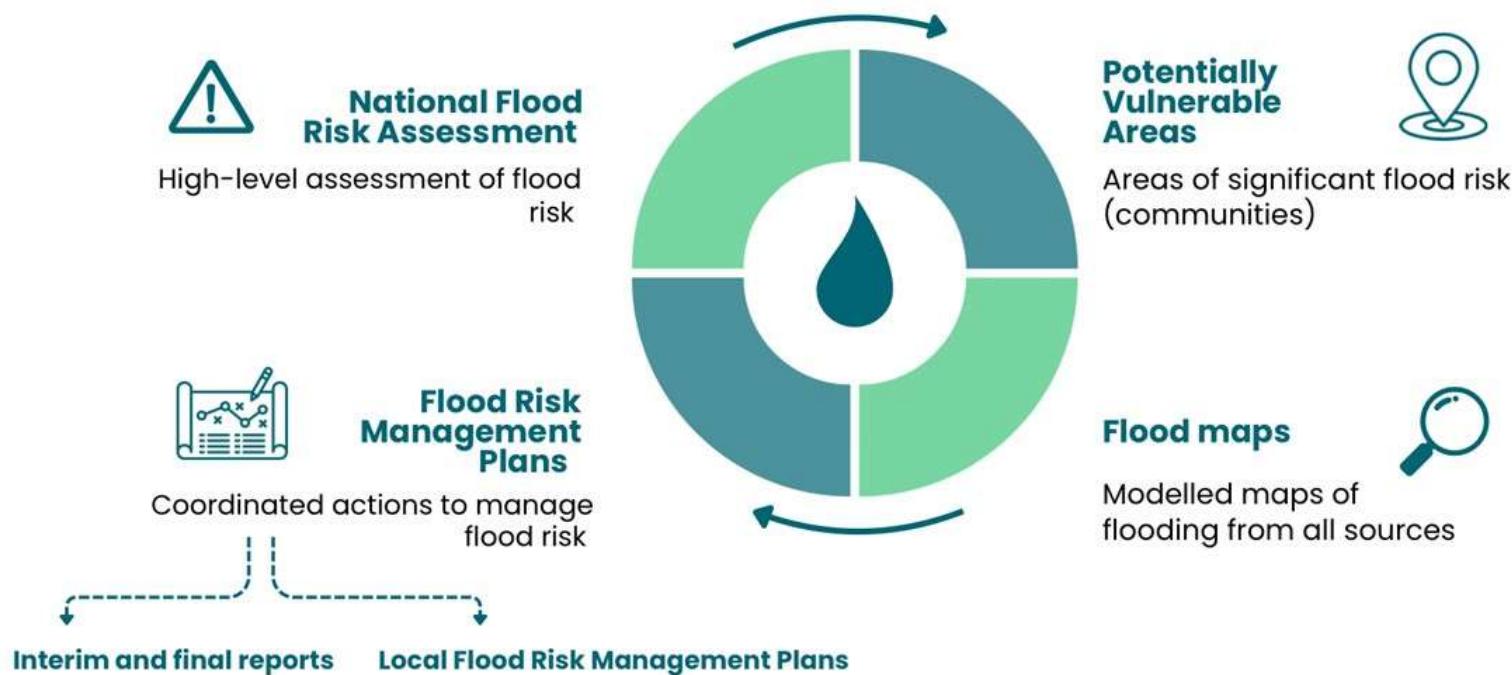
SEPA Flood Risk Management Planning Cycle 3: delivery update

Andrea Johnstonova
FRM Planning Manager (south)

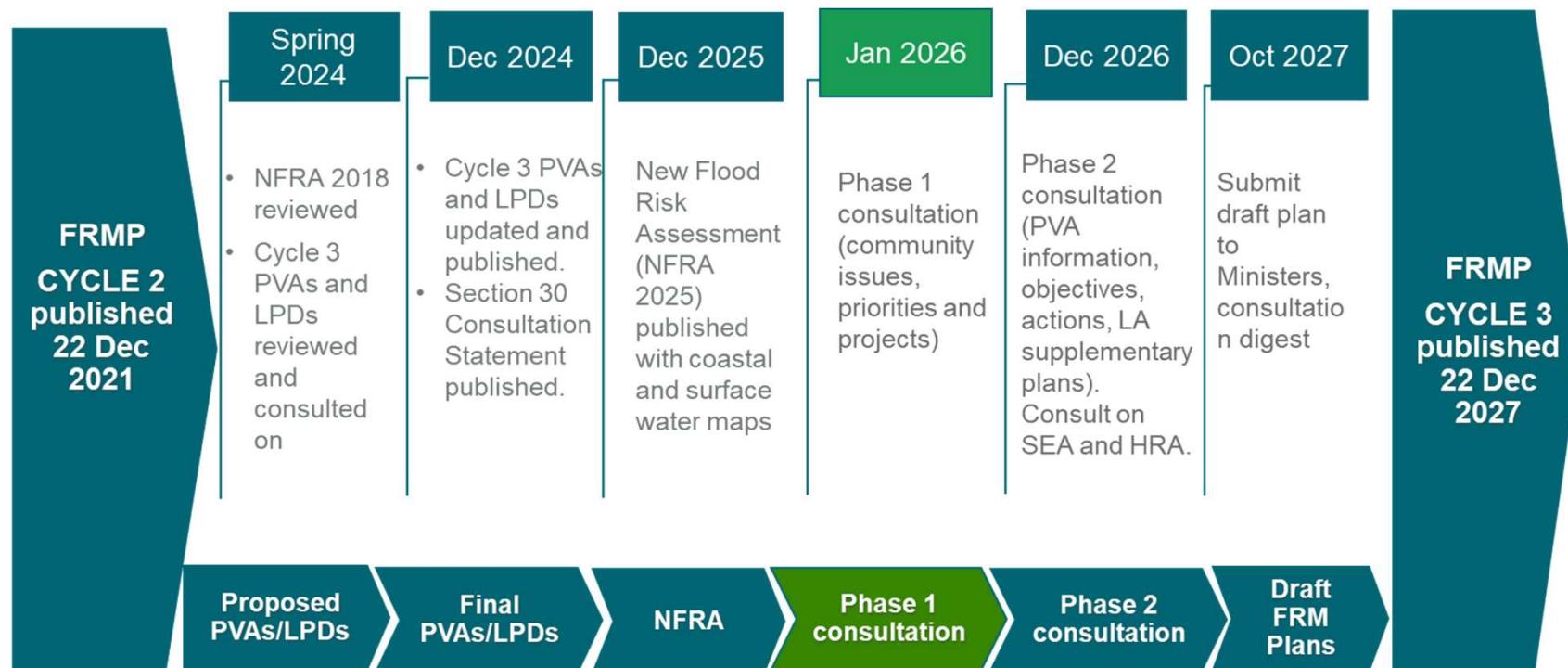
December 2025



Flood Risk Management Planning : Key stages

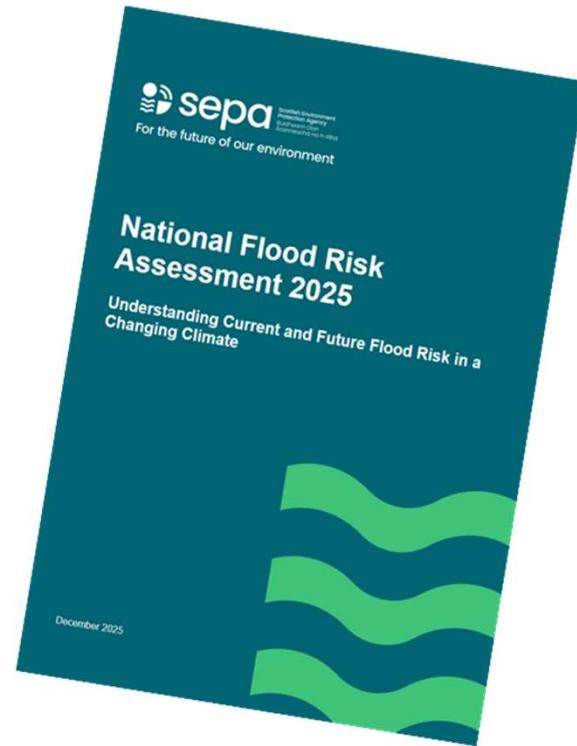
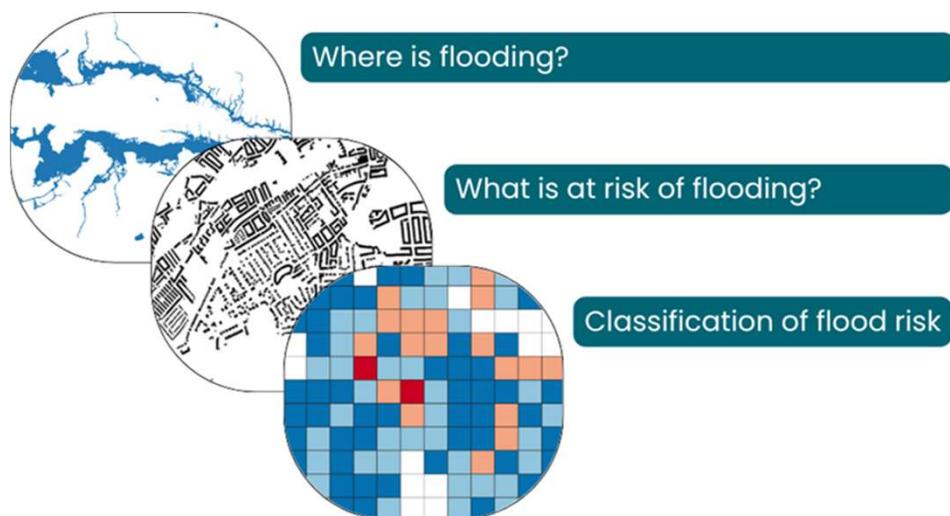


From Cycle 2 to Cycle 3 - timeline



1. National Flood Risk Assessment

- Strategic assessment of flooding in Scotland AJ0
- Better data and methods than ever before
- National evidence base that will inform next cycle of FRMP



Slide 15

AJ0 Need to explain what has changed since NFRA 2018.

Johnstonova, Andrea, 2025-12-08T13:13:22.934

ER0 0 Lauren and I have added notes to this slide.

Ronald, Eilidh, 2025-12-15T12:33:31.278

National Flood Risk Assessment



AJ0 Need key messages from the draft publication in Dec. Can we get some info with speaker notes from Lauren A?
Johnstonova, Andrea, 2025-12-08T10:50:11.657

ER0 0 We've included this infographic and added notes directing people to the report and SEPA staff on the conference stand for details on the NFRA. We're aware of your presentation timings and the need to keep this high level.
Ronald, Eilidh, 2025-12-15T12:37:29.528

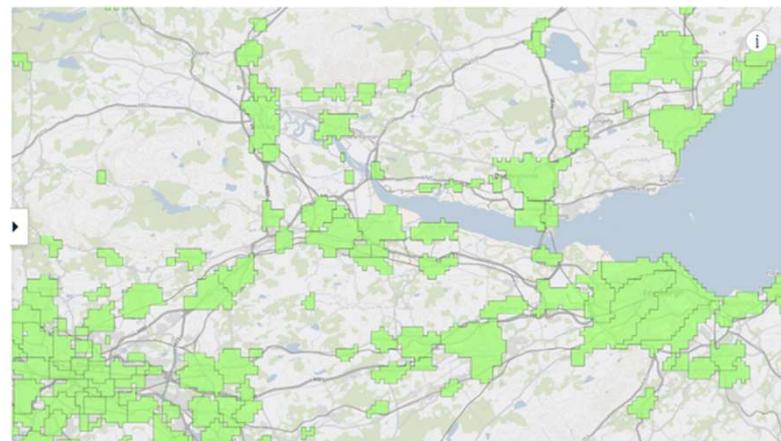
2. Potentially Vulnerable Areas

Changed to community based areas

- Potentially Vulnerable Areas (PVAs) are areas where highest flood risk exists now or is likely to occur in the future.
- They help Scotland understand and prioritise where actions to manage flooding would be of most benefit.
- In the current cycle of flood risk management planning (2022-2028) we have both catchment based PVAs and community based areas at risk known as target areas.
- The next flood risk management planning cycle (2028-2034) will use community based PVAs. This change from catchment to community based PVAs has been the result of a consultation process involving the public, local authorities, and Scottish Government.



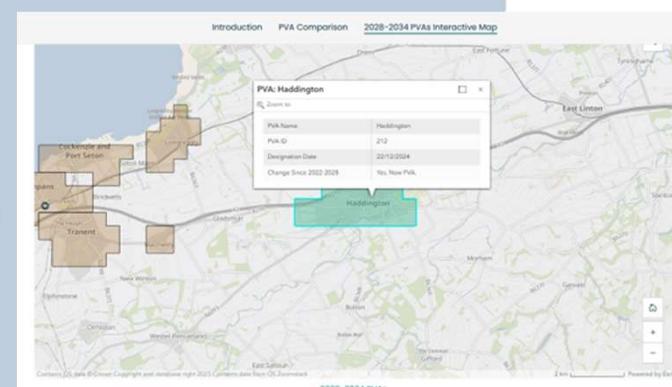
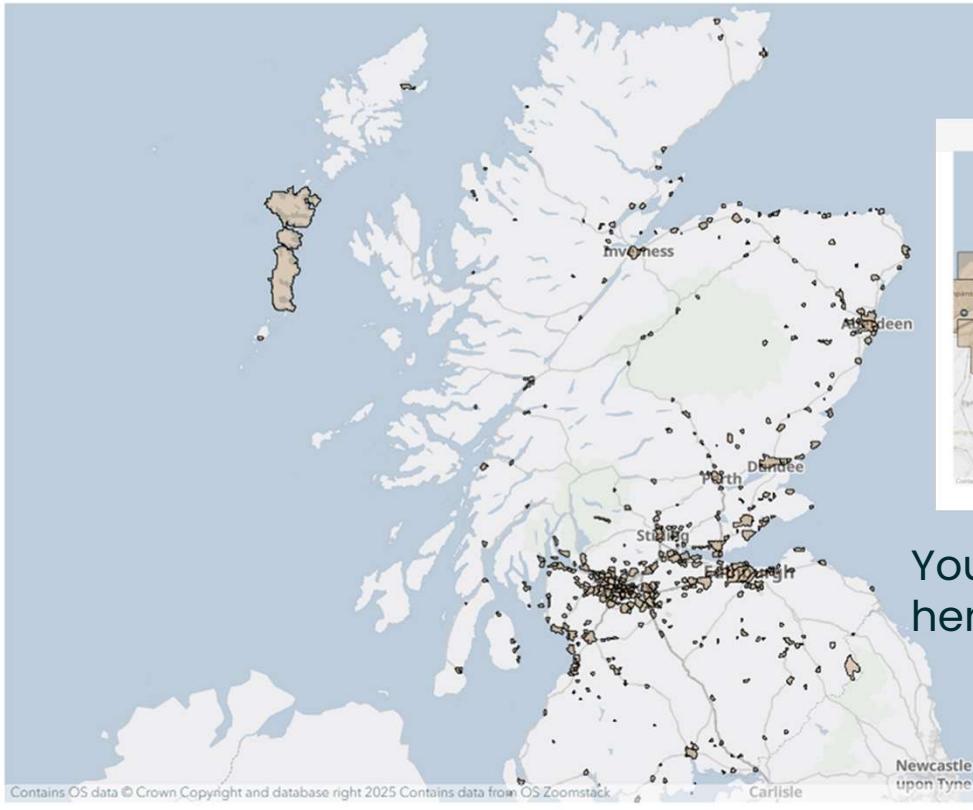
2022-2028 PVAs and Target Areas (left) and 2028-2034 PVAs (right)



2022-2028 PVAs and Target Areas (left) and 2028-2034 PVAs (right)

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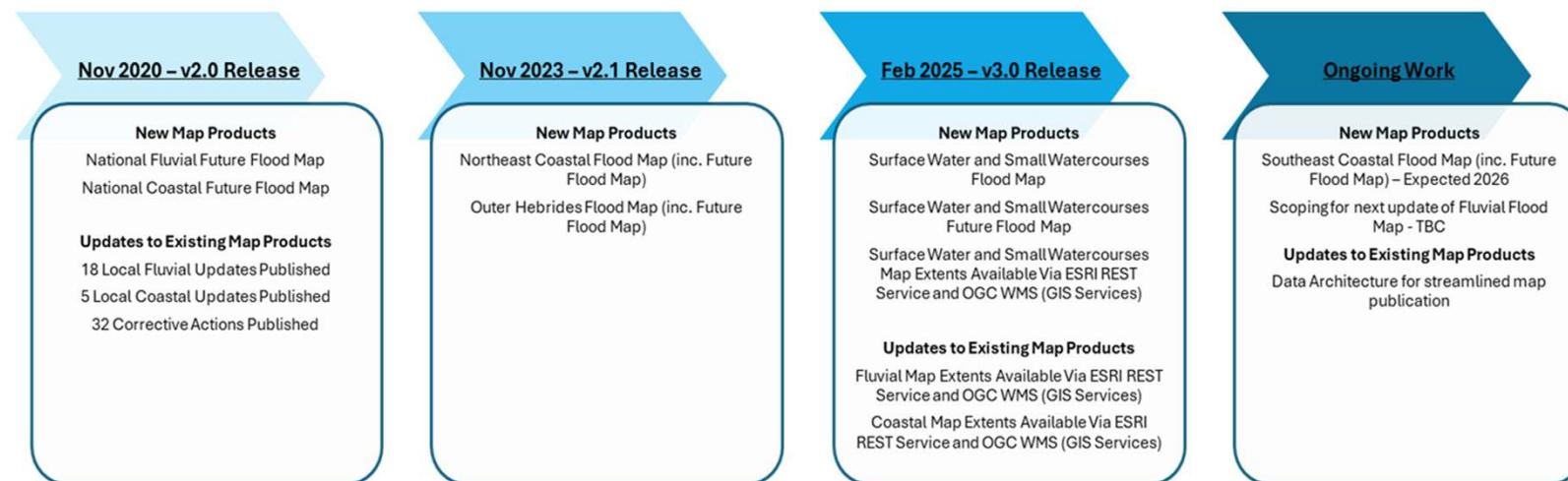
Cycle 3 PVAs in Scotland (2028 – 2034)



You can download the PVAs
here: [Environmental data](#)

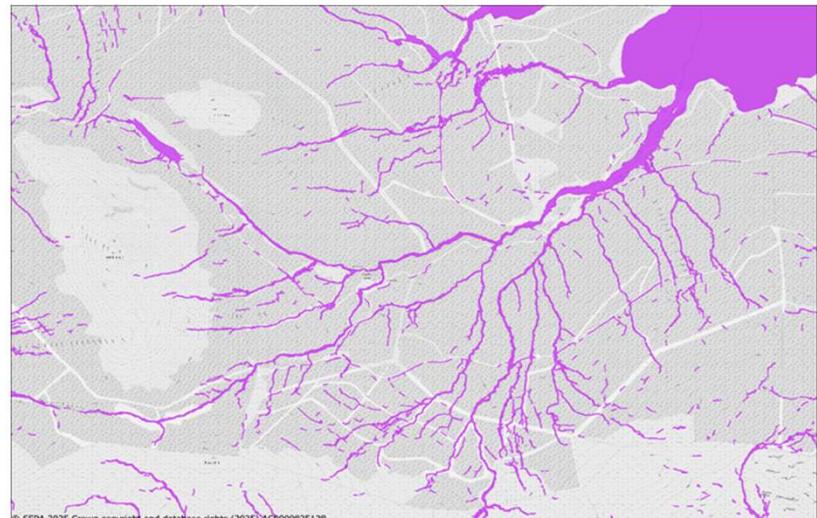
3. SEPA Flood Hazard Map updates

- The FRM Act requires SEPA to review and update flood maps every 6 years. However, SEPA delivers updates continuously as new data and information becomes available
- SEPA have made several key significant step changes to the available flood hazard mapping over the past 6 years.



Surface Water and Small Watercourses

- March 2025 - new national surface water and small watercourse flood hazard maps.
- Included for the first time is a future flood map for surface water, supporting flood risk management planning and National Planning Framework 4 (NPF4).
- Inclusion of small watercourses (those with catchment areas $<10\text{km}^2$).
- Training on use of these maps: <https://www.youtube.com/watch?v=dyhagO5Qnt8>



Slide 20

AJ0 Need a slide to summarise all changes made to the maps in recent years. Some screenshots to illustrate would be useful. Also a few key points of the use of the maps. Also future developments on next slide, would be good to make it a bit more interesting.

Johnstonova, Andrea, 2025-12-08T10:52:29.593

AJ0 0 [@Bruce, Emma] [@McFarland, Steve]

Johnstonova, Andrea, 2025-12-15T13:58:09.818

MS0 1 there's some detail and simple maps in Calum's section 24 report. Do you have a link to that?

McFarland, Steve, 2025-12-15T14:06:29.275

AJ0 2 I don't have a link, could you send it over please? Thanks Steve.

Johnstonova, Andrea, 2025-12-15T14:40:37.667

BE0 3 This slide is fine for SW&SW :)

Bruce, Emma, 2026-01-05T10:12:23.124

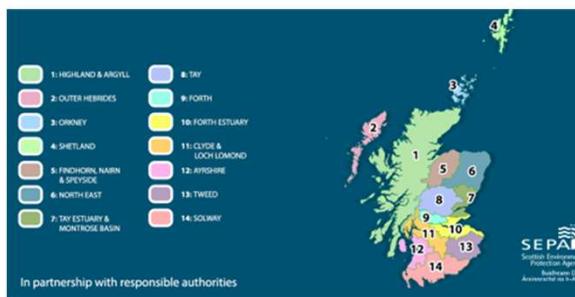
Upcoming Developments

- Contract underway to deliver updated coastal flood maps for Southeast Scotland – following publication of Northeast update
- Commenced discovery work to investigate potential options for further improving our river flood maps. We have just appointed a contract to review our current modelling and mapping approach and identify various options for future updates.
- User Needs Research (for all flood hazard map sources) was carried out in late 2025. This involved over forty interviews with stakeholders and an online survey which received considerable engagement.

4. Flood Risk Management Plans 2028 - 2034

Changes we want to make

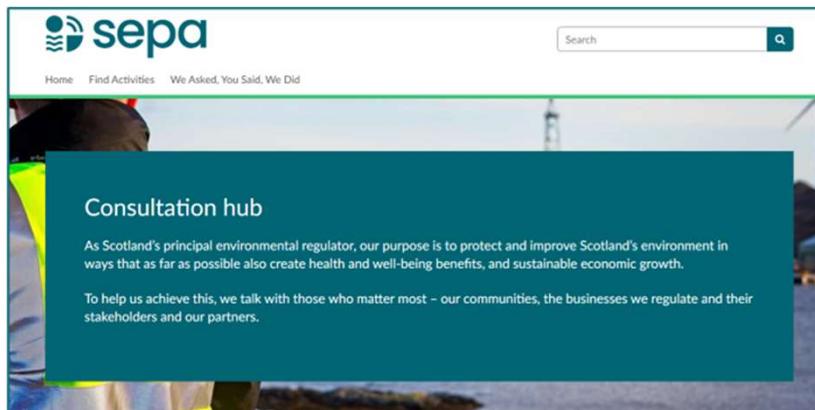
- Database and a new user-focused publication platform
- Community focus – phased approach to consultation, incorporate community issues and priorities and information on local projects and initiatives
- Focus on building resilience and climate change – capturing the themes of Scottish Government Flood Resilience Strategy within objectives and actions
- Better alignment with River Bain Management Plans (RBMPs).



Flood risk management plan datasheet		
Hawick (target area 290)		
Summary		
<p>The town of Hawick is located in the Scottish Borders on the banks of the River Teviot. The main source of surface water flooding is the River Teviot and its tributaries the Sling Water, Wilton Burn, Dean Burn and Bonshaw Burn. There is also risk from surface water flooding. There are approximately 2,600 properties and 1,600 businesses currently at risk of flooding. This is likely to increase to 3,000 properties and 1,800 businesses by the 2050s due to climate change. A flood protection scheme for Hawick is currently under development.</p>		
Objective ref	Objective type	Objective Description
2901	Avoid flood risk	Avoid inappropriate development that increases flood risk in Hawick
2902	Avoid flood risk	Avoid an increase in flood risk in Hawick by the appropriate design, management and maintenance of the Hawick Flood Protection Scheme
2903	Prepare for flooding	Prepare for current flood risk and future flooding as a result of climate change and other factors
2904	Reduce flood risk	Reduce the risk of surface water flooding and river flooding from the River Teviot and Sling Water in Hawick
What actions are proposed for this area?		
<p>As outlined in Section 1 of this plan, at the date of publication the actions below represent the best understanding of what is needed to work towards the objectives for the area. They have been developed with the other responsible authorities and take account of progress achieved to date, the understanding of flood risk and the objectives set for the area. The local flood risk management plan published in 2022 provides more information on these actions, their timing and how they will be funded and coordinated.</p>		
Actions proposed to start between 2022 and 2028		
<p>Flood study (Ref: 29001) An understanding of flood risk and associated issues in the area is to be developed, which may include monitoring and modelling and should consider the impacts of climate change on flood risk.</p> <p>Action A flood management study should be carried out for Hawick. This should assess if any catchment wide options can support and increase the level of protection offered by the Hawick Flood Protection Scheme.</p>		
<p>Flood scheme or works design (Ref: 29002) The selected preferred option for managing flood risk is to be designed following the completion of the flood study, including consideration of the long-term impacts of climate change. These can include small scale works or works to improve the existing scheme. The scheme should be designed to be adaptive for the impacts of climate change to be monitored, understood and managed.</p> <p>Action A flood defence scheme has been recommended for the Crowsbush and Whinlaw areas of Hawick. This includes the inclusion of a new 1 in 100 year plus flood defence wall and embankment (1 in 75 year and 1 in 200 year plus climate change tailors). The scheme will include a new and improved drainage measures proposed for the B8539. The scheme should be progressed through design and detailed design. There should be consideration of the current and long term flood risk and the scheme should be designed so that the area will adapt to changes in flood risk through development of an adaptation plan.</p>		
<p>Flood scheme or works implementation (Ref: 29003) The scheme or works is to be delivered following agreement of the design, costs and timescales.</p> <p>Action The scheme or works is to be delivered following agreement of the design, costs and timescales. Construction of the Hawick Flood Protection Scheme will continue to its completion by 2028. A 1 in 100 year level of protection to form a new flood defence in the centre of Hawick. The design of the new flood protection scheme should be considered in the development of an adaptation plan.</p>		

Phased approach to consultation

- Statutory requirement - consult by 22 December 2026 - publish plans by 22 Dec 2027
- Statement of consultation arrangements (S30) - phases allow for elections and analysis of responses
 - **Phase 1 consultation launching 21st January 2026 - 21st April 2026 focus on community issues and priorities**
 - Phase 2: Dec 2026 - providing further information about PVAs, flood risk, objectives, actions as well as LA supplementary information
- Citizen Space platform - improved functionality and GIS capabilities



		Phase 1 consultation	Phase 2 consultation	Final Cycle 3 FRMPs
PVA description	Why is this area a PVA	✓	✓	✓
	Summary of previous flooding in the area	✓	✓	✓
	Risk of flooding in the PVA: current & future (inc.CC)	✗	✓	✓
	Mechanism of flooding	✗	✓	✓
	PVA categorisation	✗	✓	✓
Catchment/Coastal characterisation	Catchment/Coastal area definition (GIS)	✓	✓	✓
	Catchment/coastal description	✗	✓	✓
	Catchment/coastal opportunities and constraints	✗	✓	✓
Progress to date	Progress with actions to date	✗	✓	✓
	Long term aim for the PVA	✗	✓	✓
Objectives	Shorter term objectives	✗	✓	✓
	How is progress going to be measured	✗	✗	✓
	Short to medium term actions	✗	✓	✓
Actions	Future actions	✗	✓	✓
	What can you do to manage your risk of flooding	✗	✗	✓
	What should you do in the event of flooding	✗	✗	✓
	What should you do after flooding has occurred	✗	✗	✓
Community information	You said, we did, now what	✗	✓	✓
	Community groups	✗	✓	✓

FRMP Phase 1 consultation - LIVE



Question 1: What are your main flooding concerns?

Question 2: In your opinion, what are the highest priorities for managing flood risk in your area?
Select a maximum of 3 from the list below

Question 3: Please share any projects and/or initiatives in your area that aim to reduce the impacts of flooding? These can be projects and/or initiatives within the PVA or the catchment / coastal area.

Question 4: Is there anything you are doing already to manage your own flood risk? Consider actions both at home and in your community.

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Thank you

Contact details

Andrea Johnstonova (Regional Planning Manager – South)

Email: Andrea.Johnstonova@sepa.org.uk



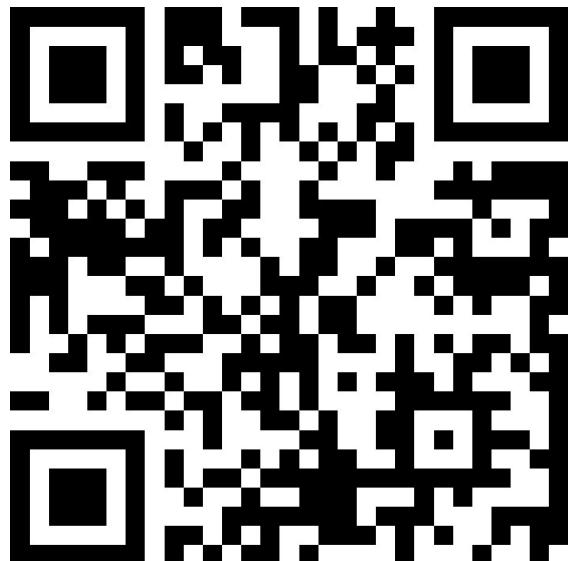


Plenary Discussion

Q&A



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Plenary Discussion Q&A

Catriona Laing and Kirstin Leath, Scottish Government
Andrea Johnstonova, SEPA

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Refreshments, Market Place and Networking

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Scotland's Flood Resilience Conference 2026

Plenary Session – Place (Coastal)

Chair: Ali Rennie, NatureScot



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The Science and the Mapping of Coastal Change

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Observations and projections of sea level rise

Matt Palmer

Met Office

Observations and projections of sea level rise

Dr Matt Palmer

Met Office Science Fellow

Joint Director of the National Climate Science Partnership

The UK National Climate Science Partnership (UKNCSP)

Driving Climate Science for Solutions

Mission: To unite and harness UK climate science capability, enhance the UK's role internationally and drive solutions for a resilient, net-zero world

- The UK is a world leader in climate science, with capability distributed across a range of institutes and organisations
- UKNCSP draws together climate research capability to drive a step-change in the production of key climate evidence and the delivery of climate solutions for decision makers



UKNCSP Working Groups

More details at <https://ukncsp.org>



Climate observations

Enhanced network of observations and provision of data



Sea level rise

Enhance capability and provide better advice to stakeholders



Climate interventions

Deliver impartial assessments of different proposed techniques



Climate modelling

Coordinated modelling for climate solutions



Climate and nature

Enhance the provision of integrated climate and nature science

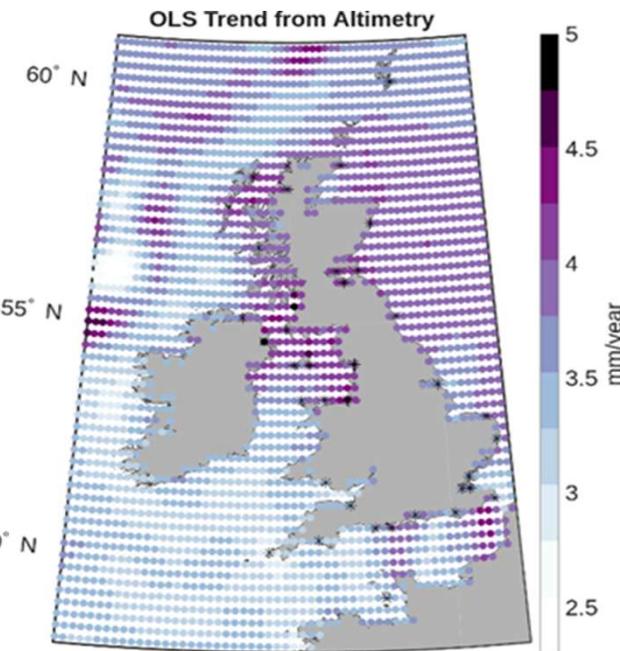
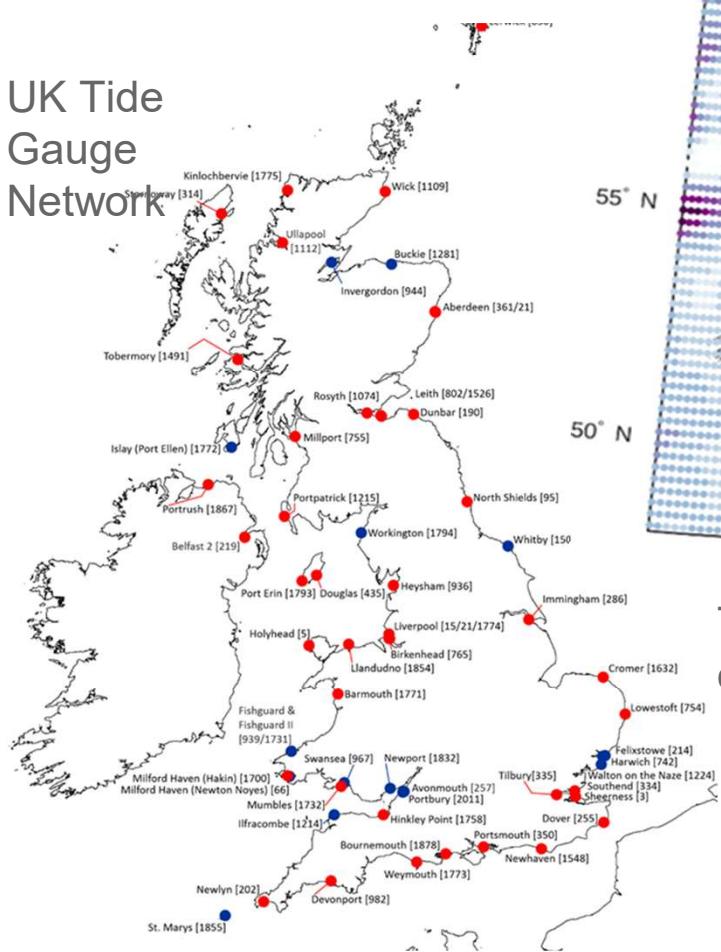


Natural hazards

Provide improved UK hazard prediction and preparedness to natural hazards

NEW: State of UK Sea Level Report

UK Tide Gauge Network

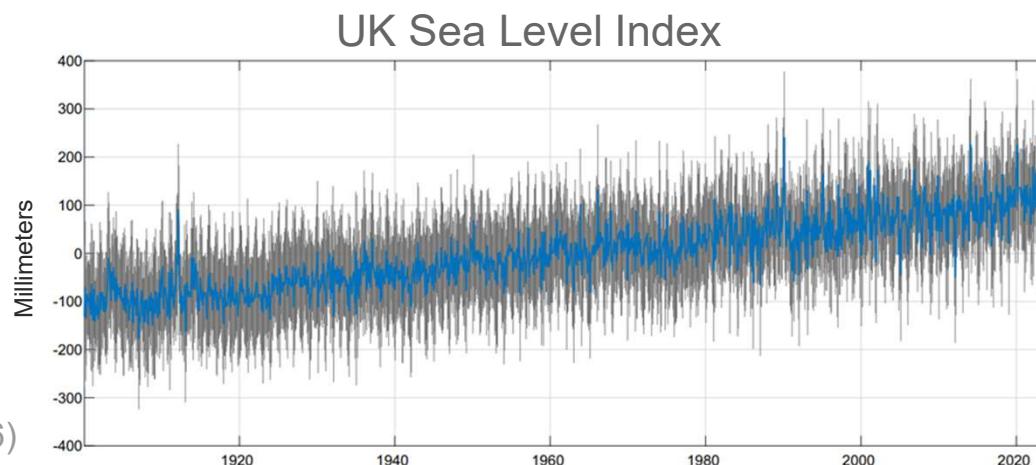


Trends from satellite observations

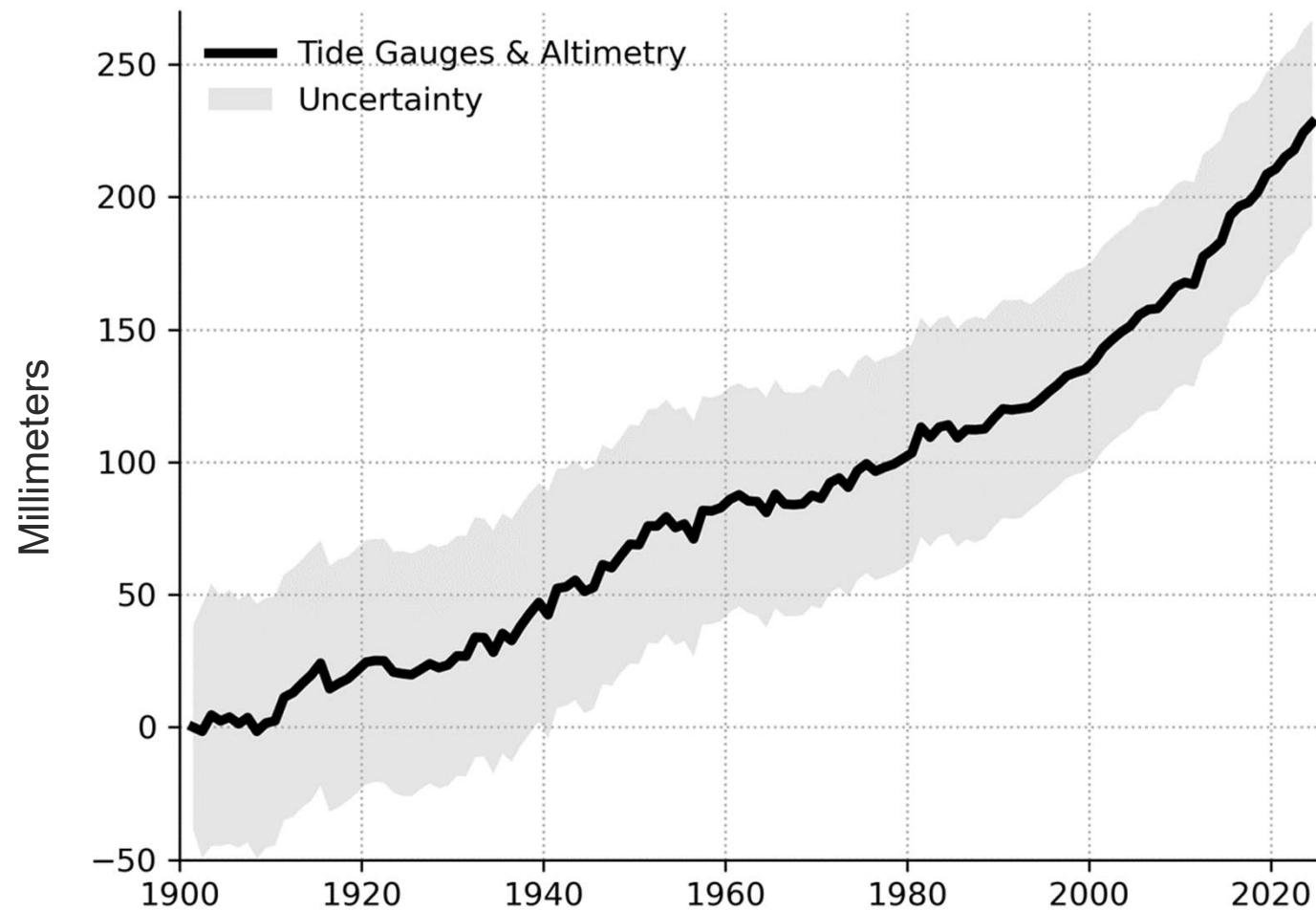
Hibbert et al (2026)

Submitted to [Ocean Science](#) in December

- Observed GMSL Rise
- UK Monitoring Status
- Trends in UK Sea Level
- Drivers of Variability (UK)
- Sea Level Projections
- Ice Sheet Processes
- Sea Level Rise Impacts

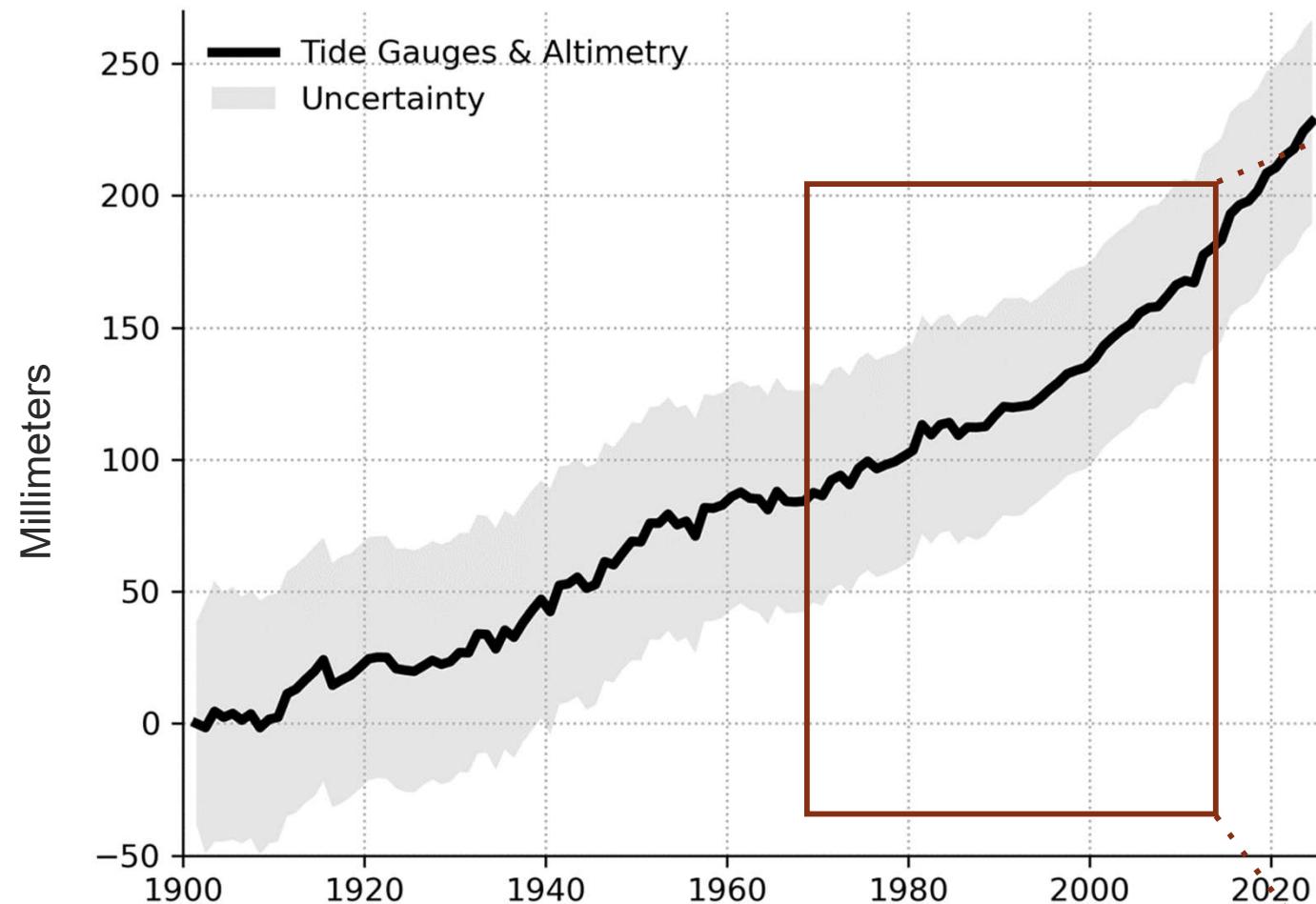


Global sea level rise since 1900

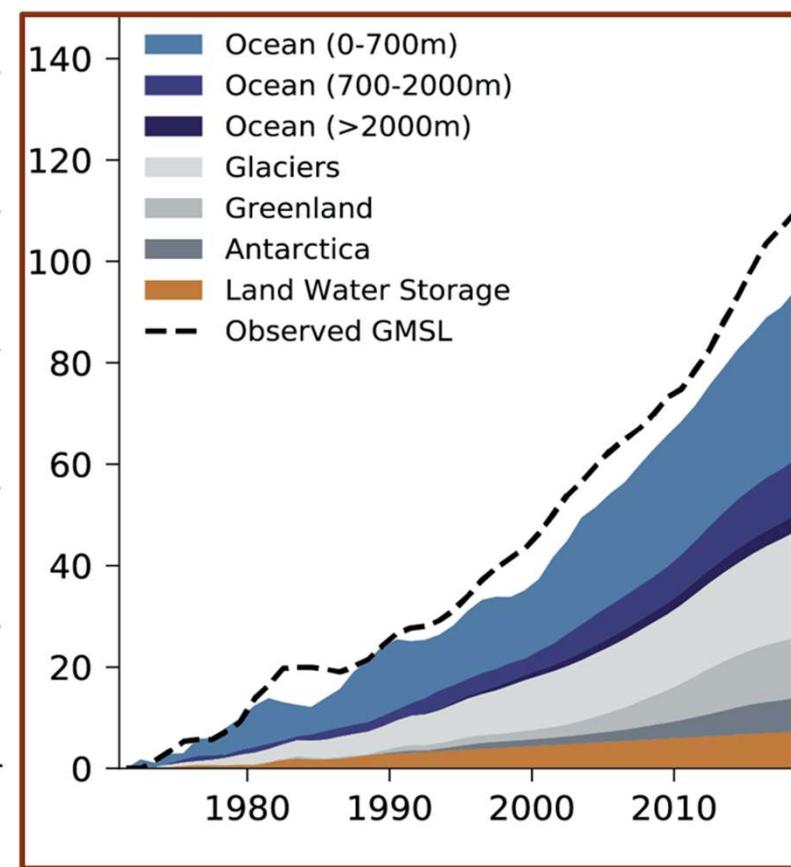


Data sources: Forster et al (2025)

Global sea level rise since 1900

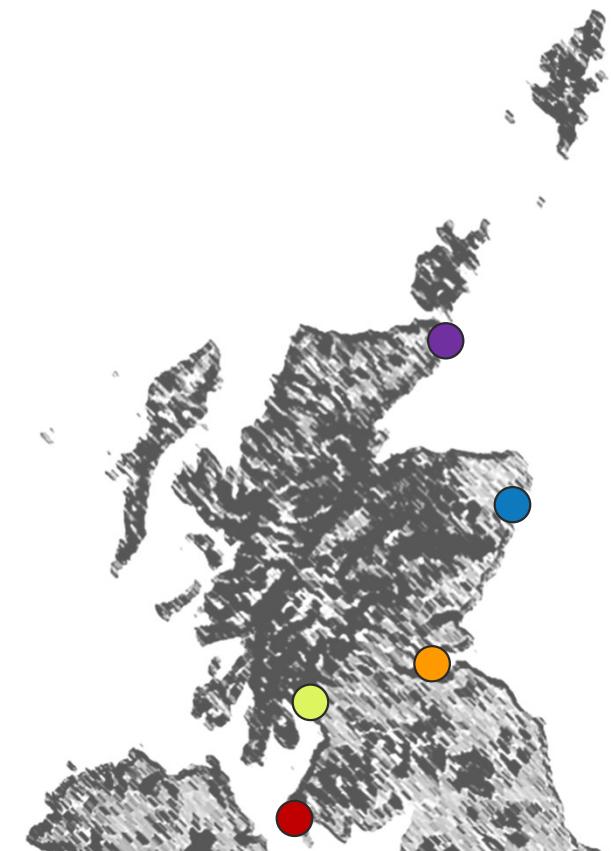
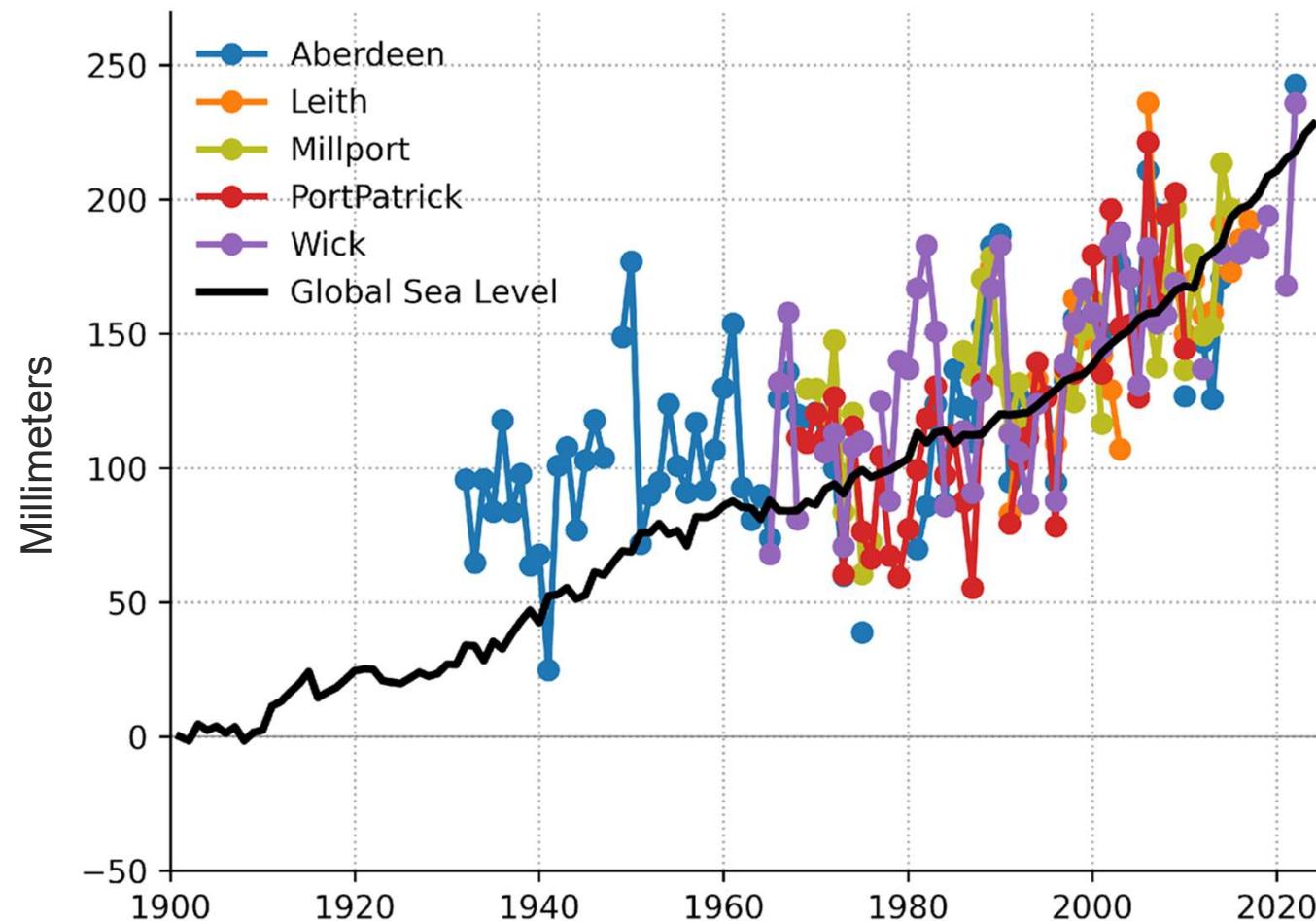


Recent acceleration partly driven by increased input from polar ice sheets



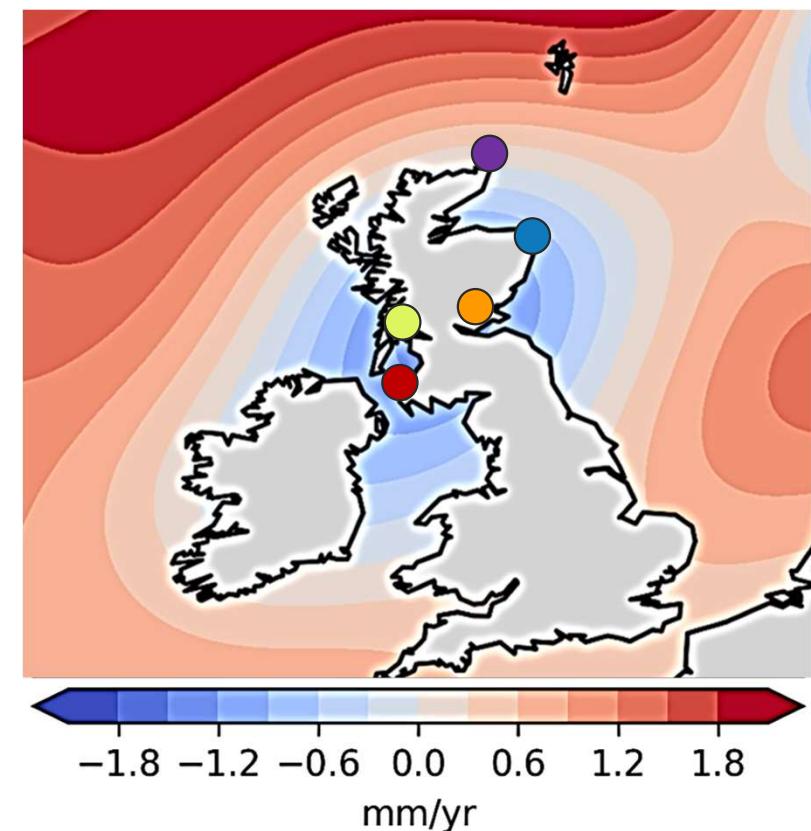
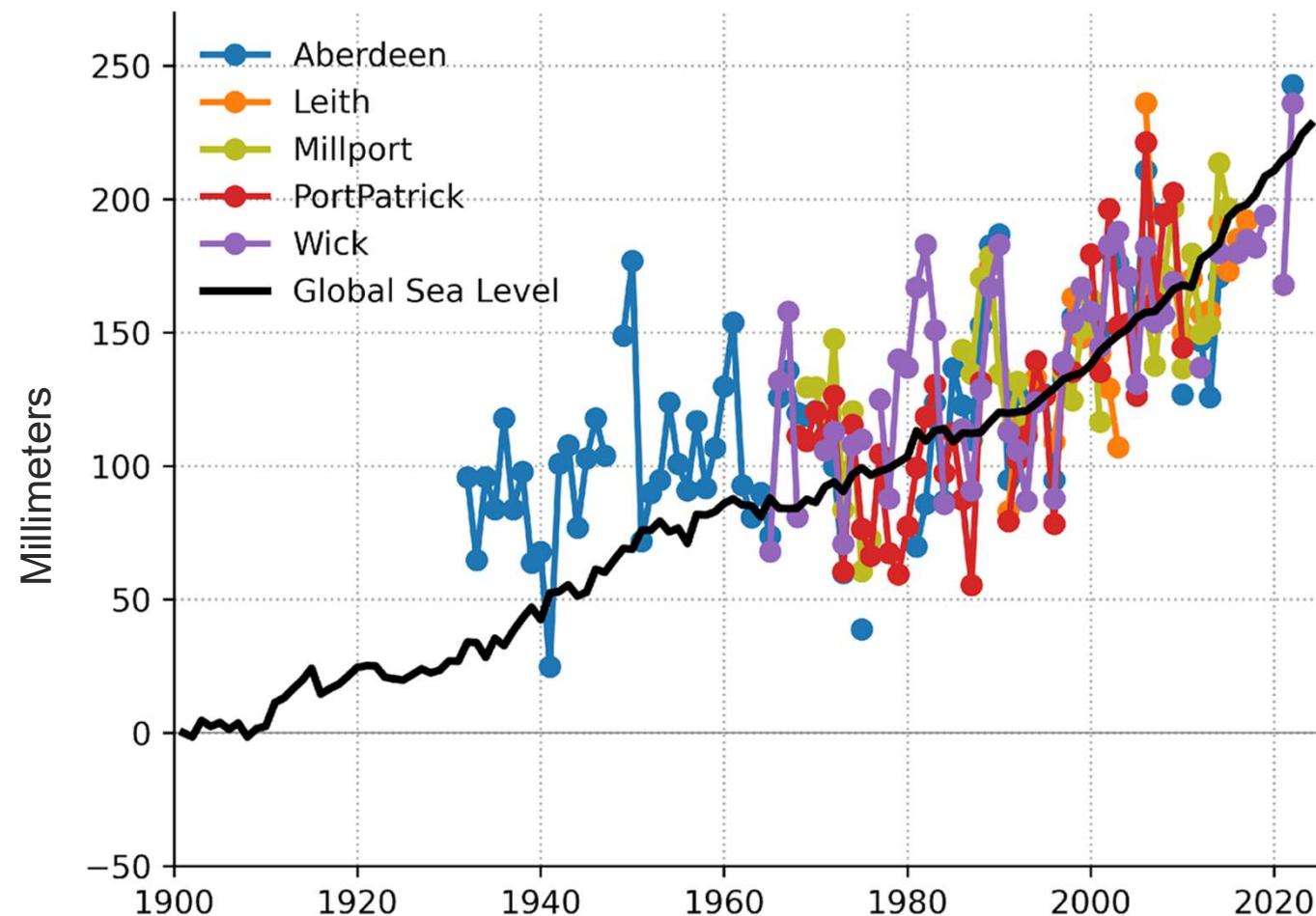
Data sources: Forster et al (2025); IPCC AR6

Sea level rise since 1900



Data sources: Forster et al (2025); psmsl.org

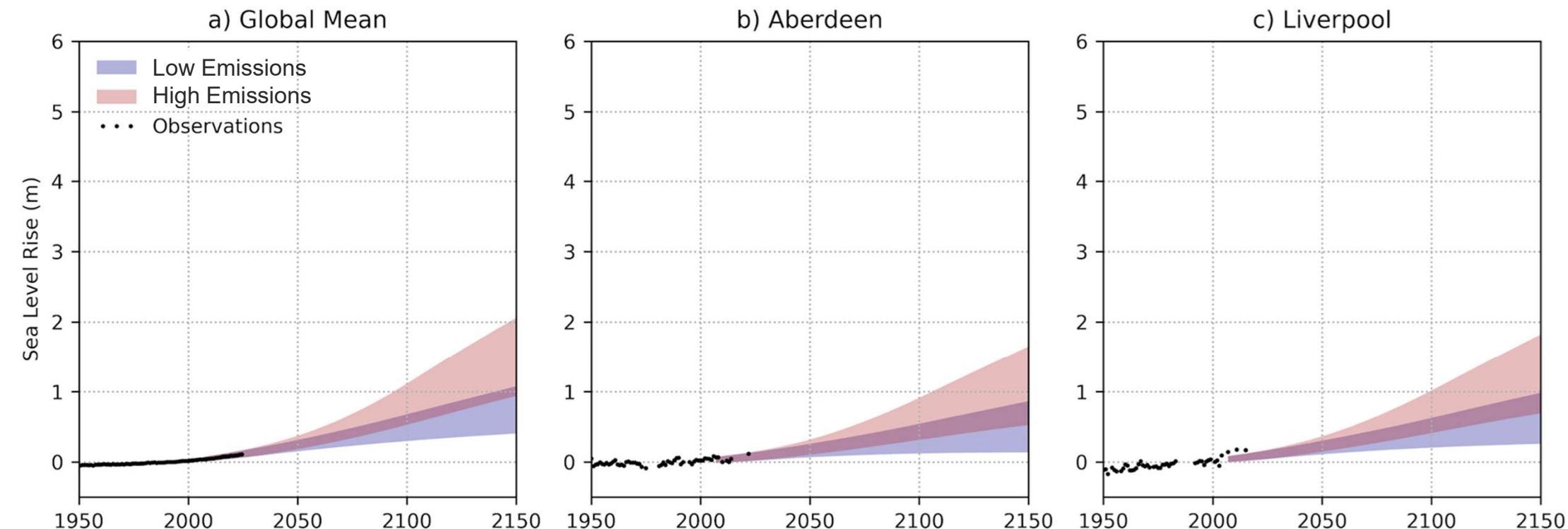
Sea level rise since 1900



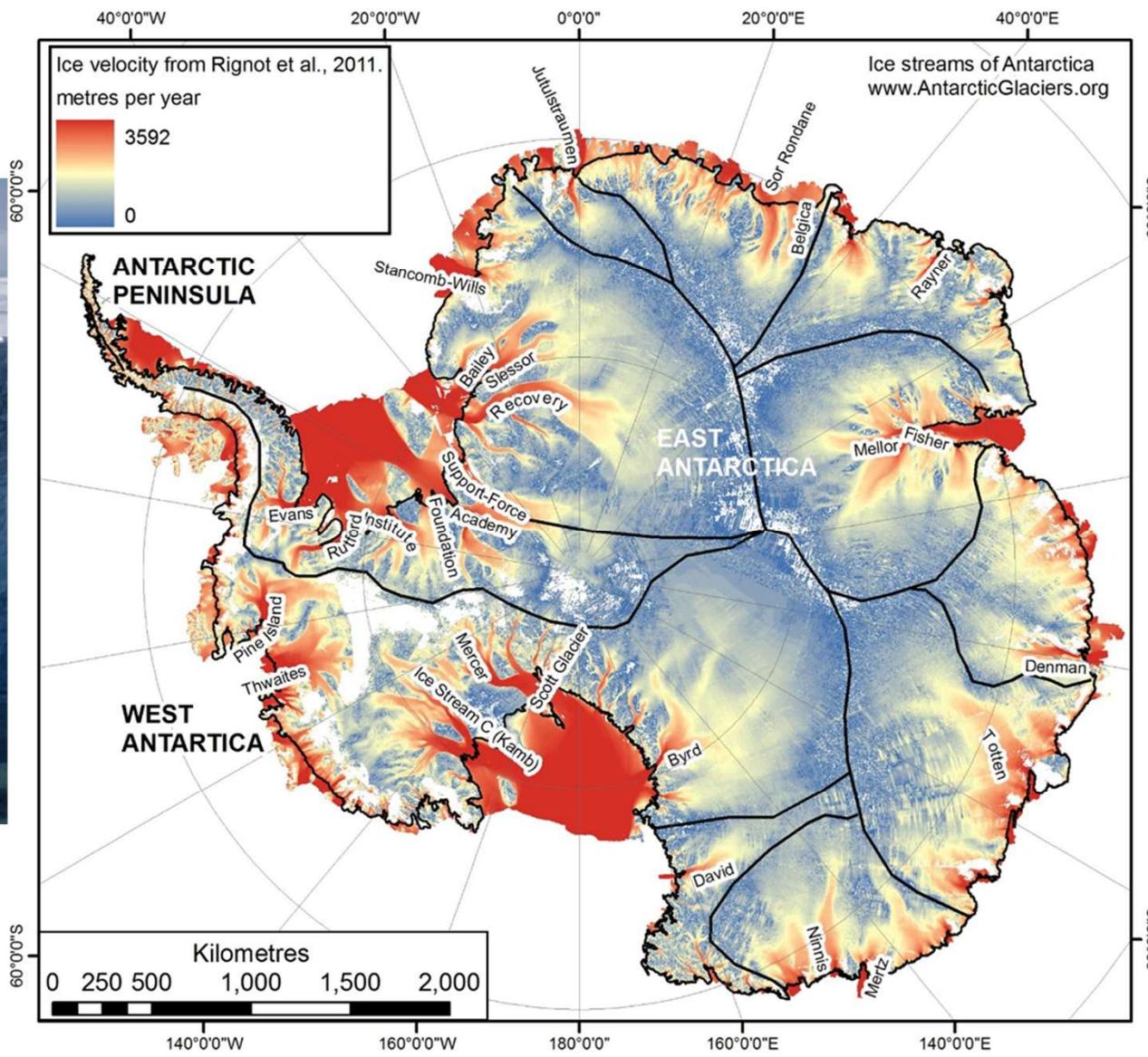
a.k.a. “post-glacial rebound”

Data sources: Forster et al (2025); psmsl.org

UK Sea Level Projections



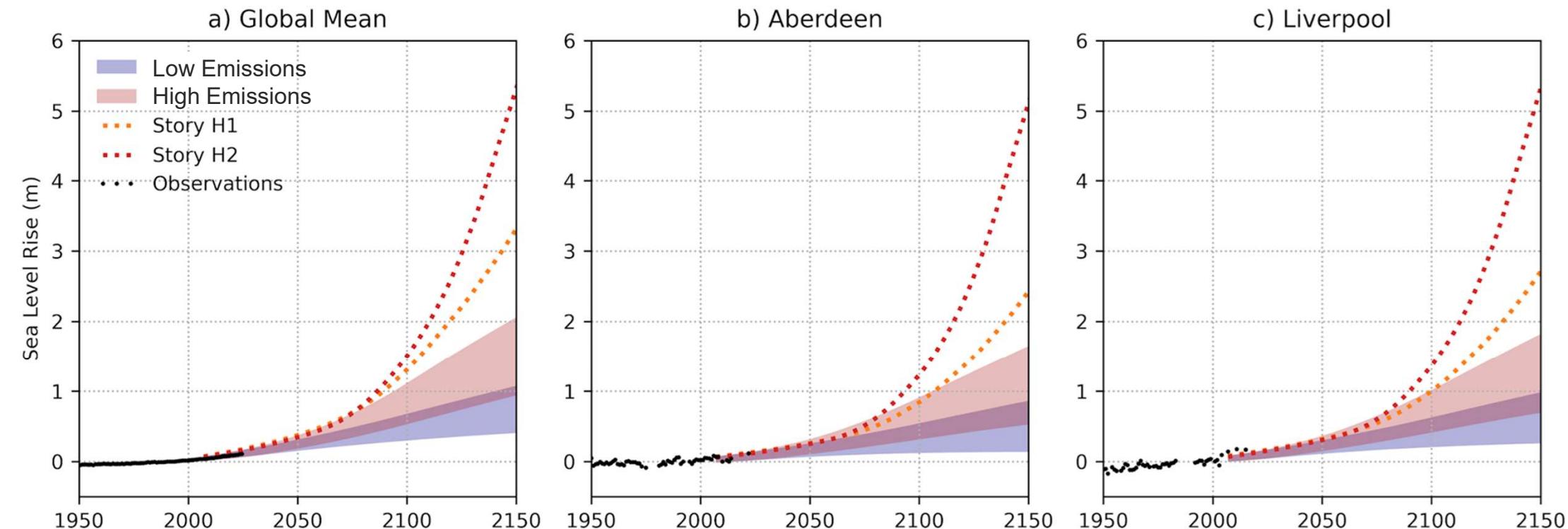
Key uncertainty: Antarctica



See <https://ukncsp.org> for a recent webinar

Data source: www.antarcticglaciers.org

UK Sea Level Projections



Summary:

- Global sea level has risen by about 20 cm since 1900 – this underlying trend is also seen in tide gauge records in Scotland
- Much of the Scottish coast experiences upward vertical land motion (associated with GIA), which acts to reduce the rate of sea-level rise
- Sea level will continue to rise for centuries => important to consider multi-century time horizons in adaptation planning
- There is huge potential to reduce the worst sea level rise outcomes through effective action to reduce global greenhouse gas emissions
- Important to monitor sea level rise processes and develop early warning systems for the worst possible outcomes

Further Reading:

Palmer et al (2024) “A framework for physically consistent storylines of UK future mean sea level rise”
Weeks et al (2025) “A New Framework to Explore High-End Sea Level Rise for the UK: Updating H++”



Stay in Touch

For more information please contact

ukncsp.org

sealevel@ukncsp.org

UK National Climate Science Partnership (UKNCSP)

UKNCSP



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Regional Flood Mapping: SE Coastal Mapping Update

Lisa Harrison

SEPA





Scottish Environment
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For the future of our environment



Regional Flood Mapping

SE Coastal Mapping Update

Verture Conference January 2026

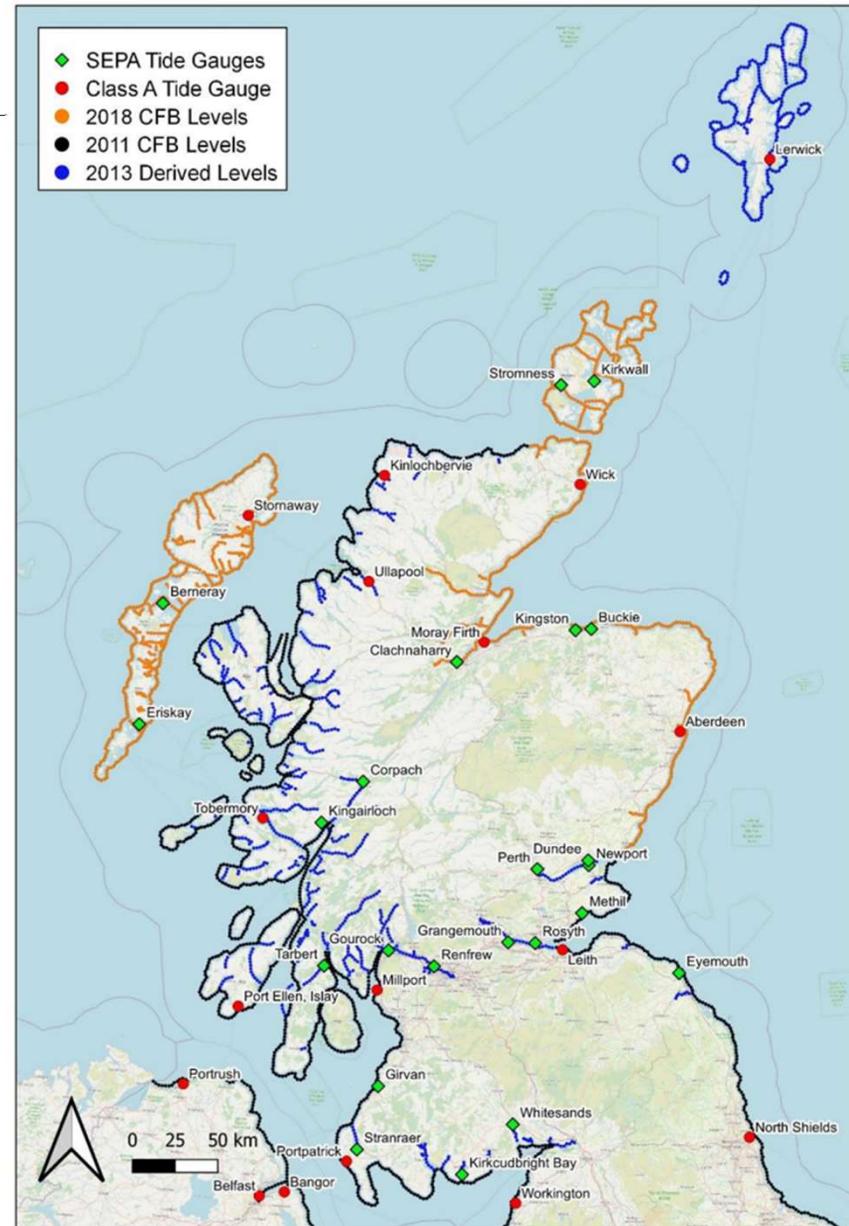
Coastal Flood Hazard Maps

2013 National Hazard Maps

- National coastal study developed to meet the requirements of the FRM Act (2009).
- Published scenarios:

Likelihood of flooding	Return Period
High	10yr
Medium	200yr
Low	1000yr
Climate Change	200yr

- Base year: 2008
- Climate projections: UKCP09 High 95th% 2080
- Horizontal projection method using 2011 Coastal Flood Boundary (CFB) Dataset.
- Where CFB not available, existing studies, gauged levels or donor relationships used.



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SE Coastal Flood Hazard Maps

Coastal Flood Hazard Maps

Regional Updates

Aim: Improve the representation of hazards and support Local Authorities, partner organisations, communities, and individuals to increase their understanding and support decision making.

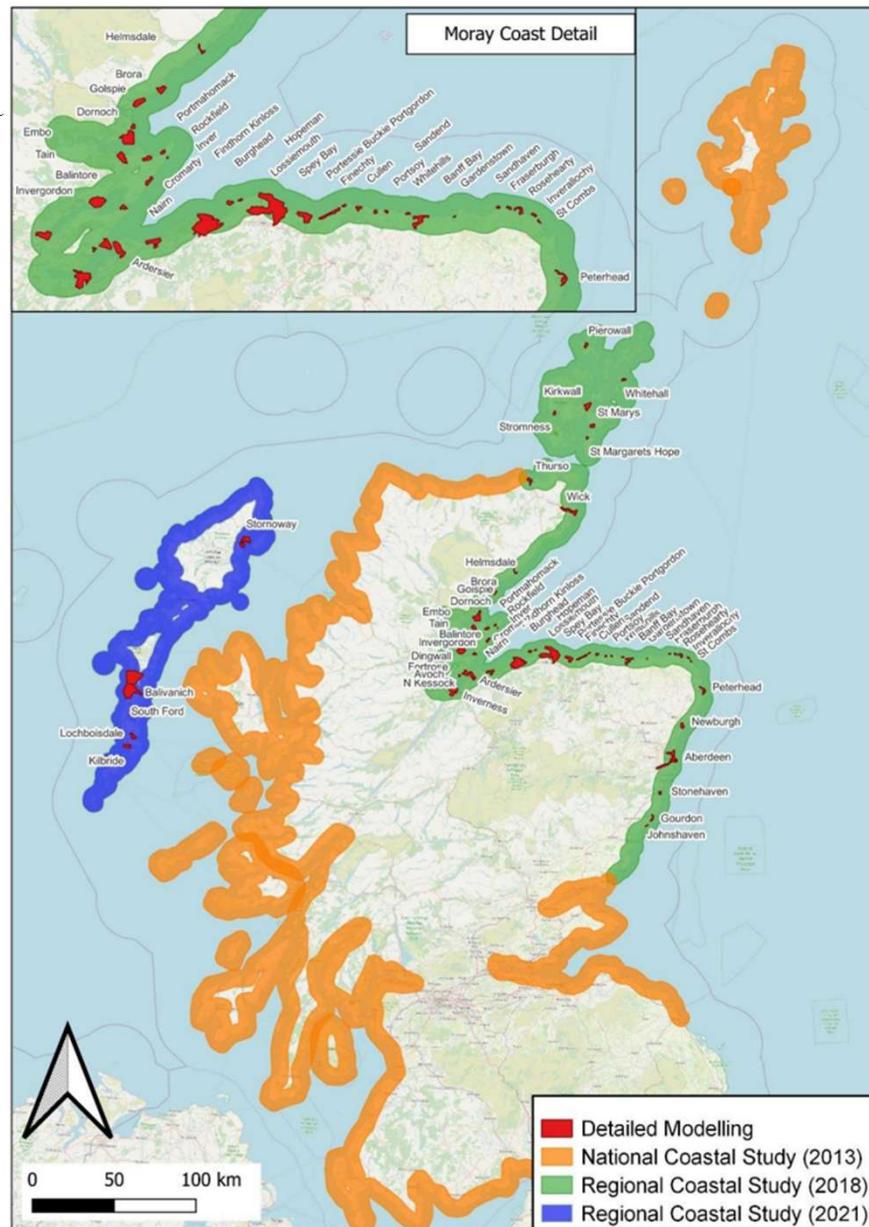
1. Northeast Scotland and the Orkney Islands (2018)
2. Outer Hebrides (2021)
3. NEW: Southeast Scotland (early 2027)

Method Changes: detailed modelling, waves now included (runup and overtopping)

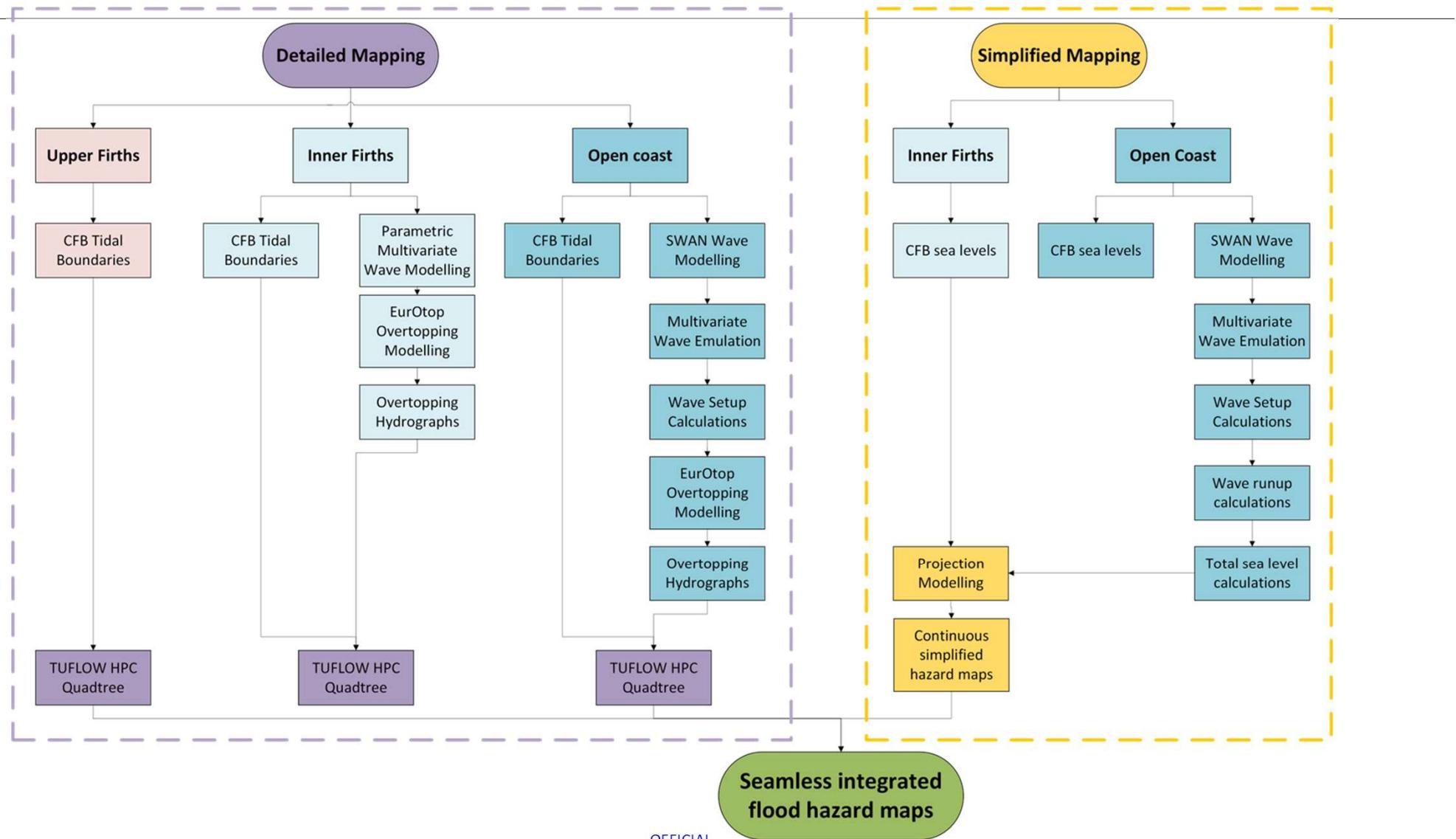
Data Changes:

- Base year: 2025
- Climate Projections: UKCP18 High 95th% 2100
- CFB 2018
- Joint probability (river flow, high tide and surge, and extreme waves)
- LiDAR + topographic surveys

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Modelling Methods Overview

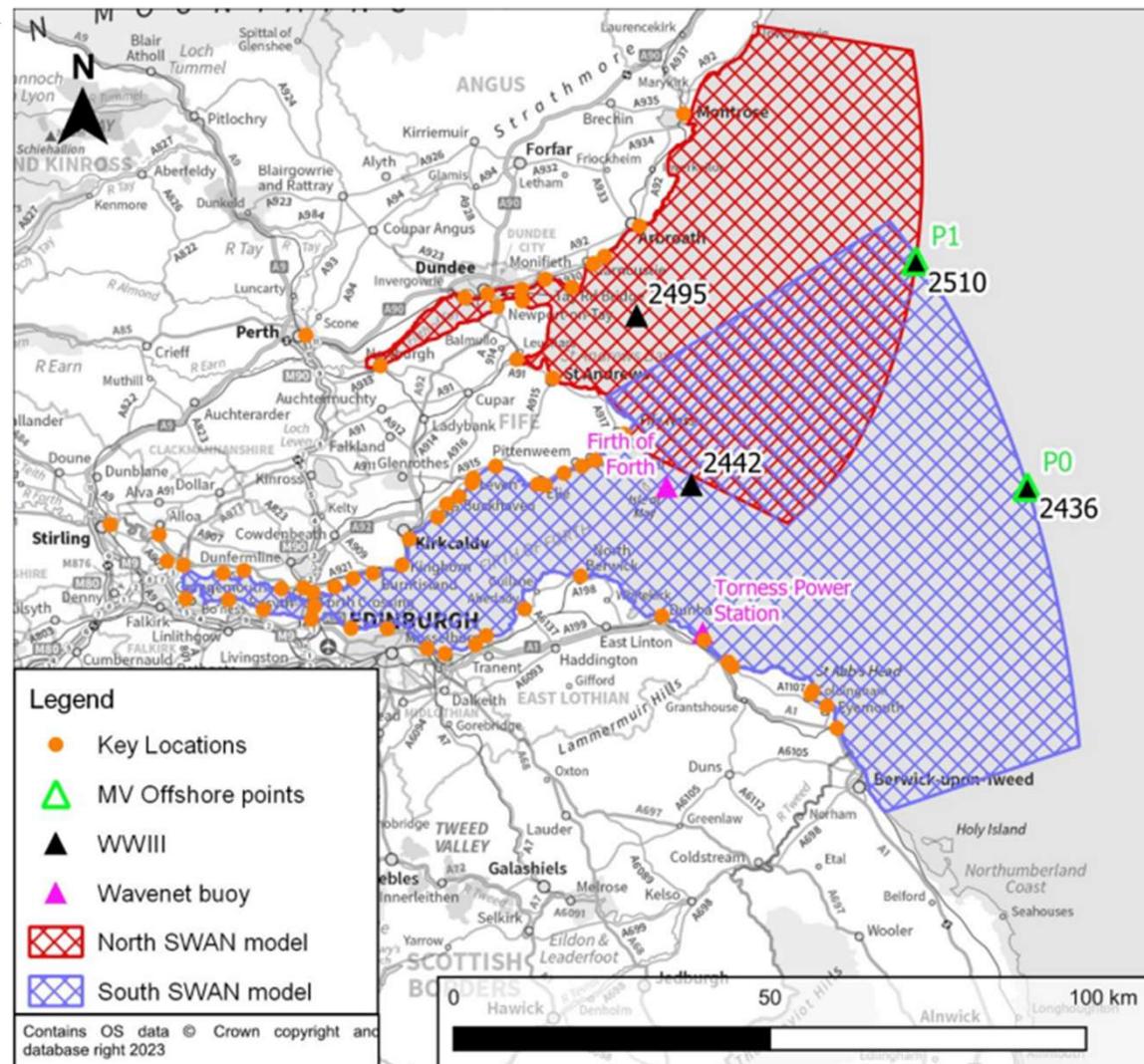


SE Coastal Flood Hazard Maps

Key areas- SE Detailed models

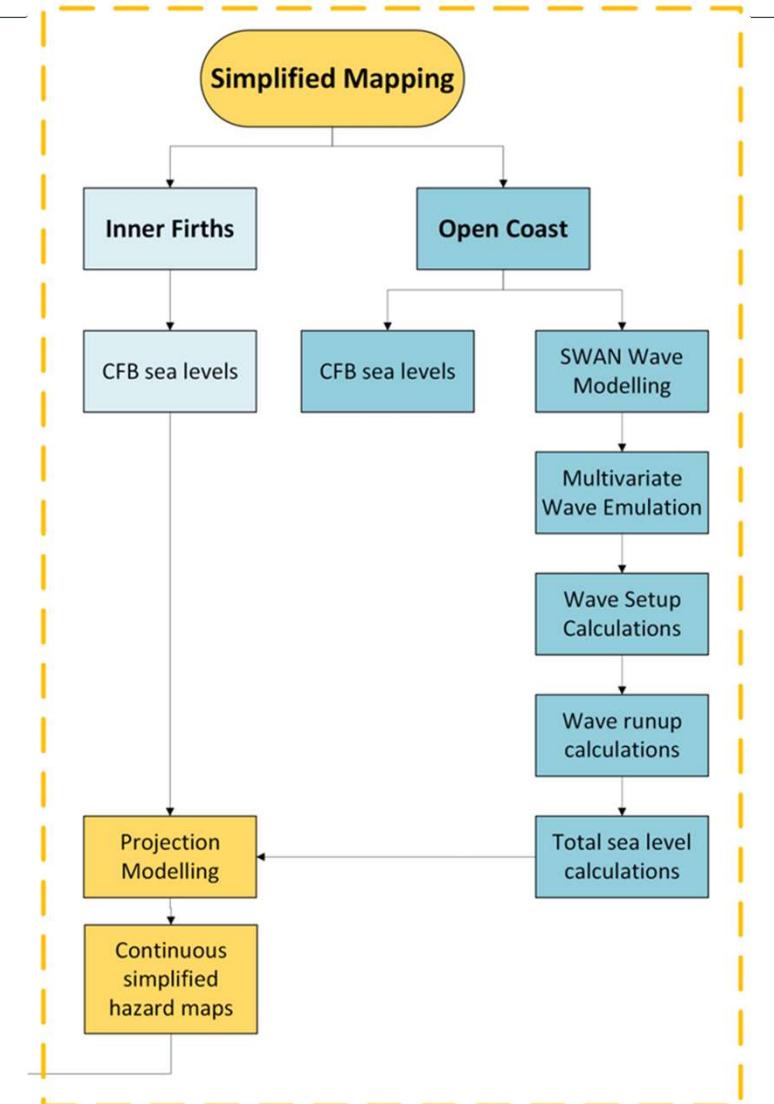
- 39 Detailed models, split into 5 Phases for 3 location types
- All areas include the Coastal Flood Boundary as a Tidal boundary condition
- Upper Firths inc. tidal limits & joint probability
- Overtopping: fetch-limited vs. SWAN wave model
- EurOtop used to calc mean overtopping discharge rate at defences

Phase	Location	Description
1	Upper Firth	Still water only risk or fetch limited. No projection modelling.
2	Inner Firth	Overtopping risk fetch limited: Parametric Models
3	Open Coast	Overtopping risk: SWAN Model
4		
5		



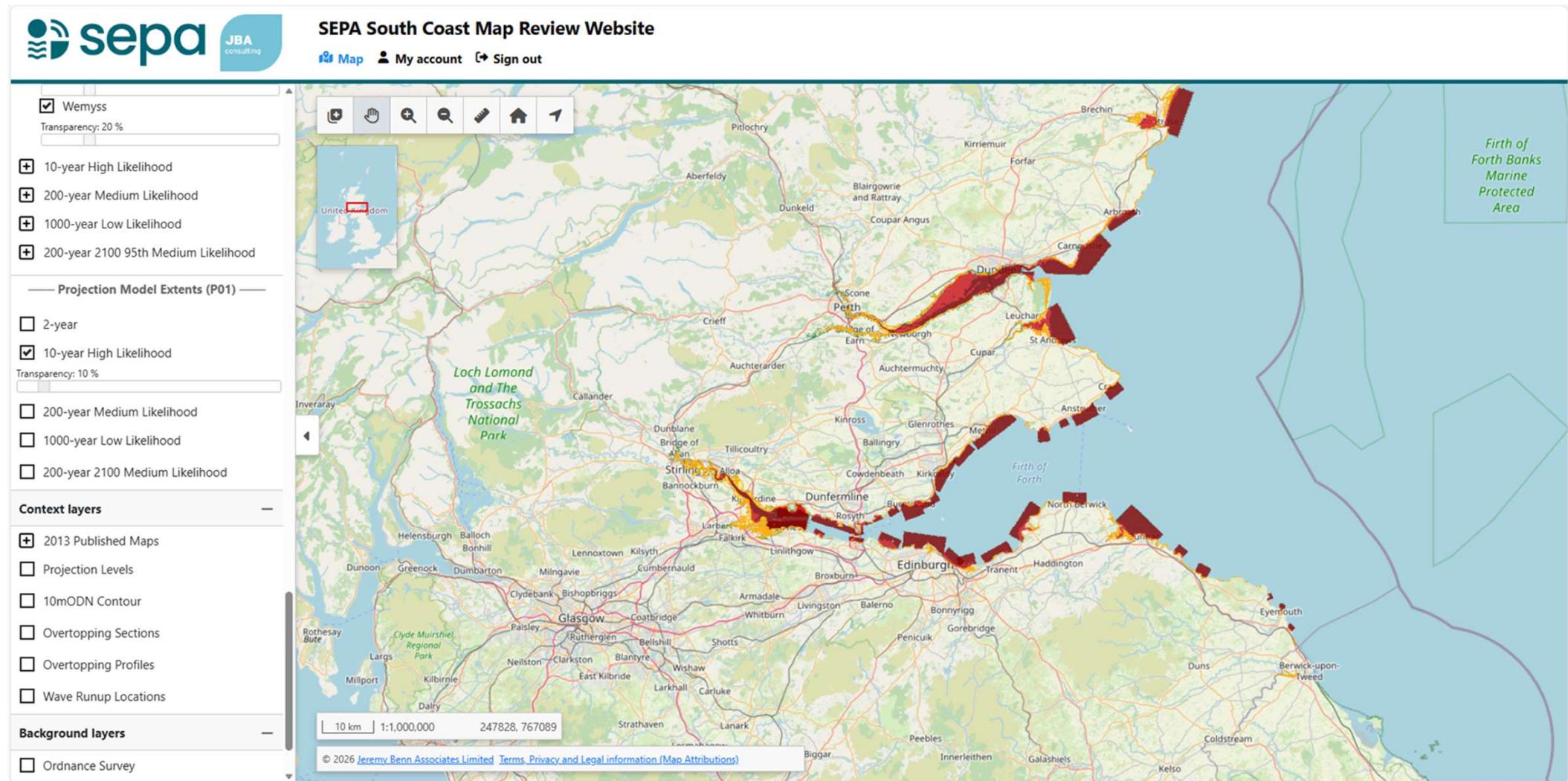
Projection Modelling

- Simplified method using 2018 CFB levels with run-up in selected areas
- Run-up calculated based on beach composition (Sand/Gravel)
- Two equations used: Stockdon (sand) or Poate (gravel). This calculates a value for the highest 2% of swash waves.
- Wave parameters taken from a point in nearshore and used in calcs.
- Levels applied along coastline. Generally, one wave point and slope estimated per bay/beach and applied across this area.
- Final steps: post-processing to remove dry/wet islands and tidy up any anomalies. Model outputs are then merged into a single output.



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SE Coastal Flood Hazard Maps



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What stage are we at now?

Completed:

- Draft detailed model and projection model results reviews
- Stakeholder review- web portal
- Model re-runs
- Merging of detailed and projection model results
- Final round of model reviews for merged results (January 2026)

Next steps:

- Feed back to stakeholders
- Final draft reporting review (January 2026)
- Project deliverables (April 2026)
- Presentation to partners (May 2026)
- Path to publication → prior to March 2027



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Thank you

Dr Lisa Harrison, Steve McFarland, Sarah Coleman, Marc Becker

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Moray High Tides Visuals

Will Burnish
Moray Council

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 AtkinsRéalis

WHAT DOES SEA LEVEL RISE MEAN TO A MORAY VILLAGE



WHAT IS THE COMMUNITY

- Nearly all the properties are not at risk of flooding according to the future maps created my SEPA.
- The street is at the rear of the village and doesn't have a coastal frontage.
- The high spring tides currently have limited impacted and is not affected by coastal erosions.
- The chosen road has 9 properties on it.
- The area is flooded by a small burn which is linked to the River Spey and in the tidal zone.

WHERE IS IT?



HOW HAS THE DATA BEEN DERIVED

- We have taken Data from the SEPA Tidal gauge at Kingston for 2023.
- Looked at when it Flooded based on a Road Level of 2.5m from a topographical survey and used this to form the baseline
- Applied UKCP18 RCP8.5 95% data (supplied by Ali Rennie)
- Add 0.19m Sea Level rise for 2050 and 0.53 m for 2080 to the baseline data.

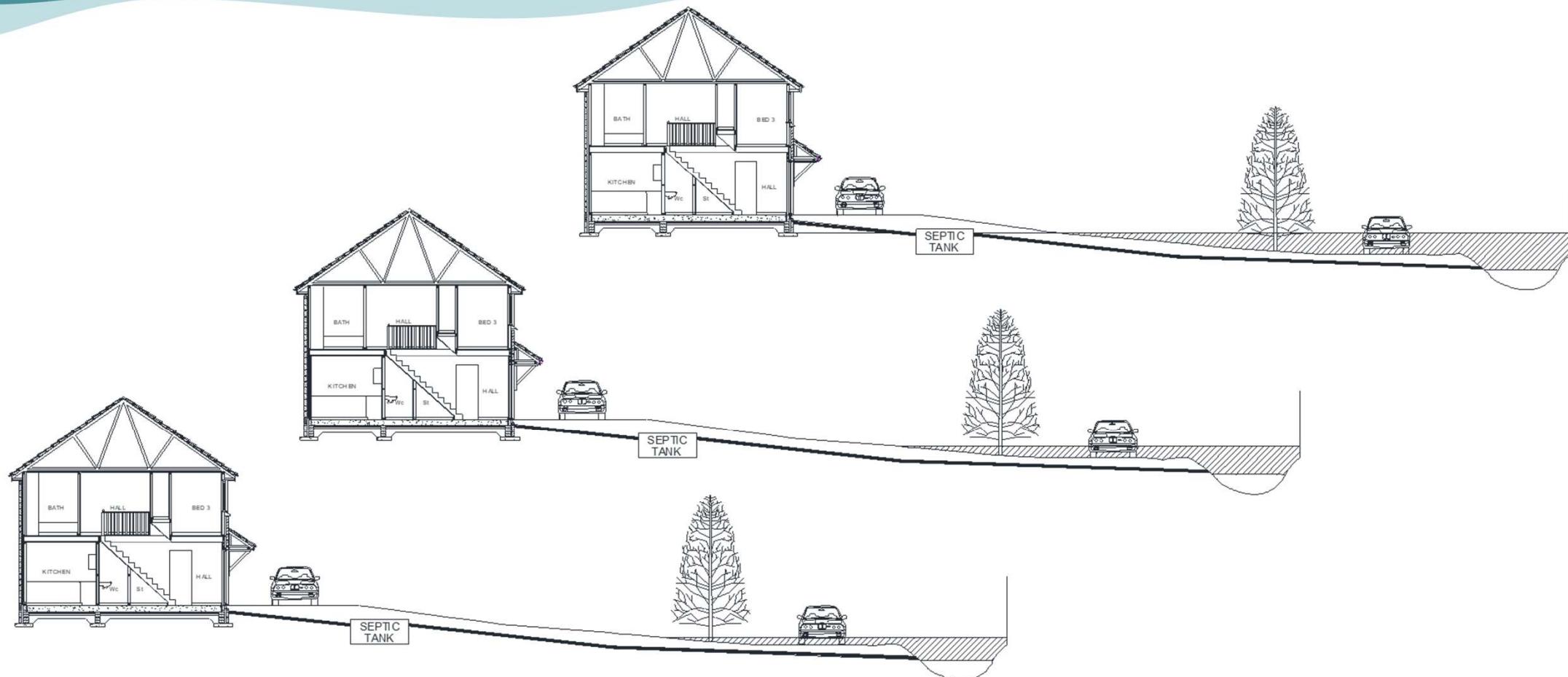
WHAT DOES IT MEAN IN TIME

Actual Tide From 2023											
January	1	2	3	4	5	6	7	8	9	10	11
	12	13	14	15	16	17	18	19	20	21	22
February	1	2	3	4	5	6	7	8	9	10	11
	12	13	14	15	16	17	18	19	20	21	22
March	1	2	3	4	5	6	7	8	9	10	11
	12	13	14	15	16	17	18	19	20	21	22
April	1	2	3	4	5	6	7	8	9	10	11
	12	13	14	15	16	17	18	19	20	21	22
May	1	2	3	4	5	6	7	8	9	10	11
	12	13	14	15	16	17	18	19	20	21	22
June	1	2	3	4	5	6	7	8	9	10	11
	12	13	14	15	16	17	18	19	20	21	22
July	1	2	3	4	5	6	7	8	9	10	11
	12	13	14	15	16	17	18	19	20	21	22
August	1	2	3	4	5	6	7	8	9	10	11
	12	13	14	15	16	17	18	19	20	21	22
September	1	2	3	4	5	6	7	8	9	10	11
	12	13	14	15	16	17	18	19	20	21	22
October	1	2	3	4	5	6	7	8	9	10	11
	12	13	14	15	16	17	18	19	20	21	22
November	1	2	3	4	5	6	7	8	9	10	11
	12	13	14	15	16	17	18	19	20	21	22
December	1	2	3	4	5	6	7	8	9	10	11
	12	13	14	15	16	17	18	19	20	21	22

High Tide in 2050 +0.19m											
January	1	2	3	4	5	6	7	8	9	10	11
	12	13	14	15	16	17	18	19	20	21	22
February	1	2	3	4	5	6	7	8	9	10	11
	12	13	14	15	16	17	18	19	20	21	22
March	1	2	3	4	5	6	7	8	9	10	11
	12	13	14	15	16	17	18	19	20	21	22
April	1	2	3	4	5	6	7	8	9	10	11
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July	1	2	3	4	5	6	7	8	9	10	11
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	12	13	14	15	16	17	18	19	20	21	22
November	1	2	3	4	5	6	7	8	9	10	11
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December	1	2	3	4	5	6	7	8	9	10	11
	12	13	14	15	16	17	18	19	20	21	22

High Tide in 2080 +0.53m											
January	1	2	3	4	5	6	7	8	9	10	11
	12	13	14	15	16	17	18	19	20	21	22
February	1	2	3	4	5	6	7	8	9	10	11
	12	13	14	15	16	17	18	19	20	21	22
March	1	2	3	4	5	6	7	8	9	10	11
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December	1	2	3	4	5	6	7	8	9	10	11
	12	13	14	15	16	17	18	19	20	21	22

WHAT DOES I MEAN IN HEIGHT?



WHAT DOES IT MEAN IN AREA?



PAUSE FOT THOUGHT

- When should we start to think about sea level rise and its impact to structures and infrastructure?
- Should we start to think about how this links to place based planning and what the community will look like now and in the future?
- How do we bring the community along the journey?
- How do we link this impact to the daily live in the future, like access to education, care, shops.
- How we explain these challenges when the properties are flooding

venture

 #Floodresilience2026

 Scottish Government
Riaghaltas na h-Alba
gov.scot

England's National Coastal Erosion Risk maps

Ruben Borsje

Haskoning

FLOODRE

AECOM

 AtkinsRéalis

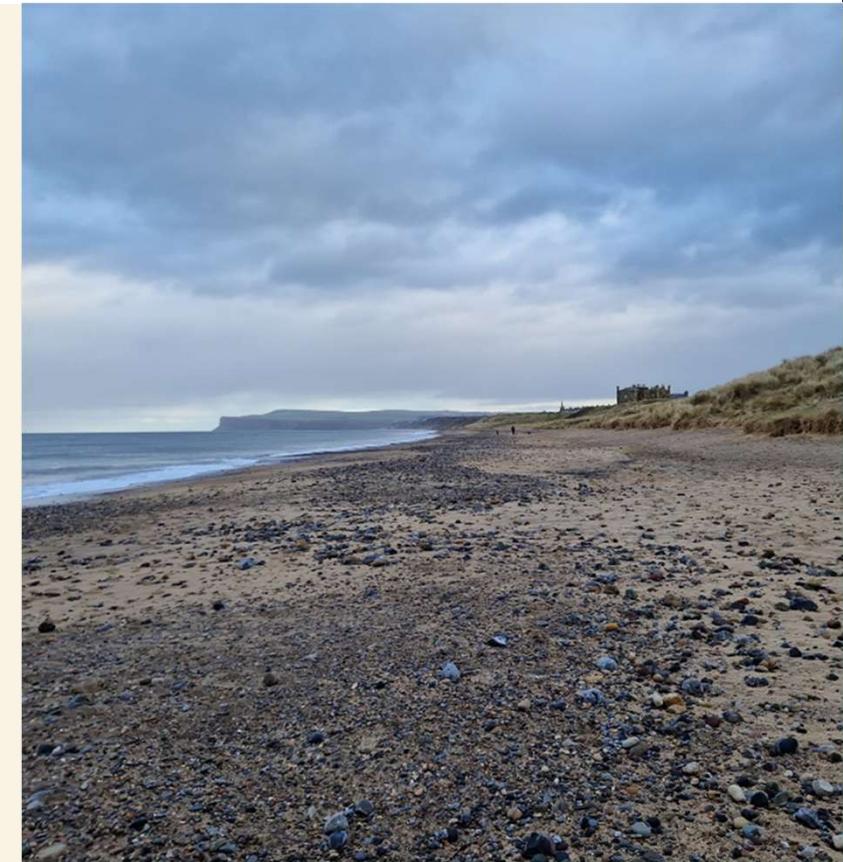


Insights from England's National Coastal Erosion Risk maps

What, how and why relevant for Scotland?

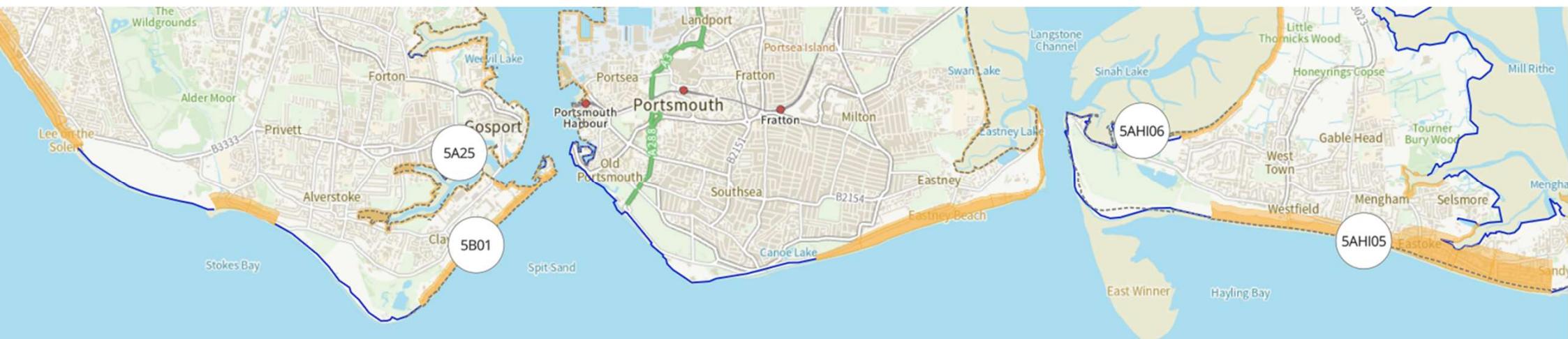


Ruben Borsje, MSc
*Associate Leading Professional
Flood & Coastal Resilience*

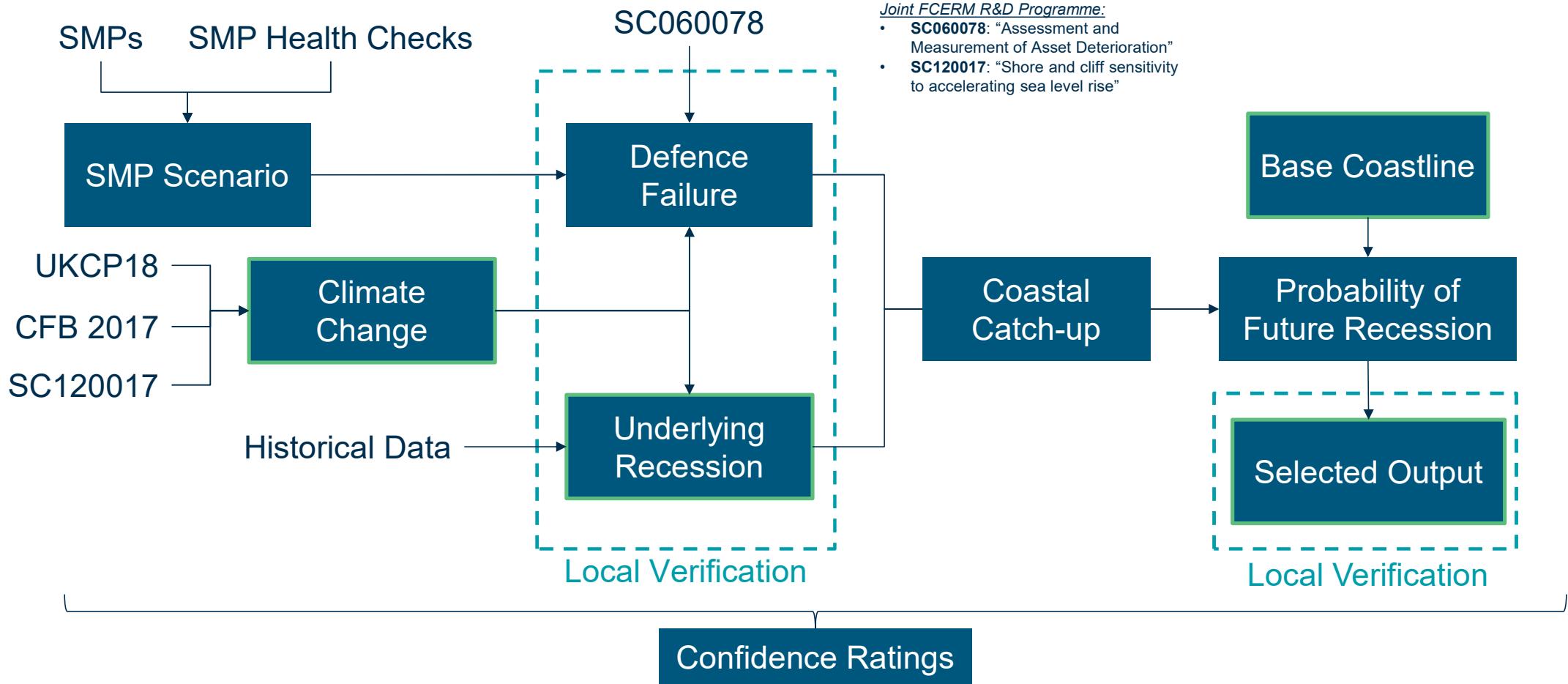


National Coastal Erosion Risk Mapping

- National erosion dataset up to 2105 for non-floodable frontages in England
- Based on the latest scientific developments, available data and local insights
- Collaboration between Jacobs, Haskoning & Channel Coastal Observatory for the Environment Agency



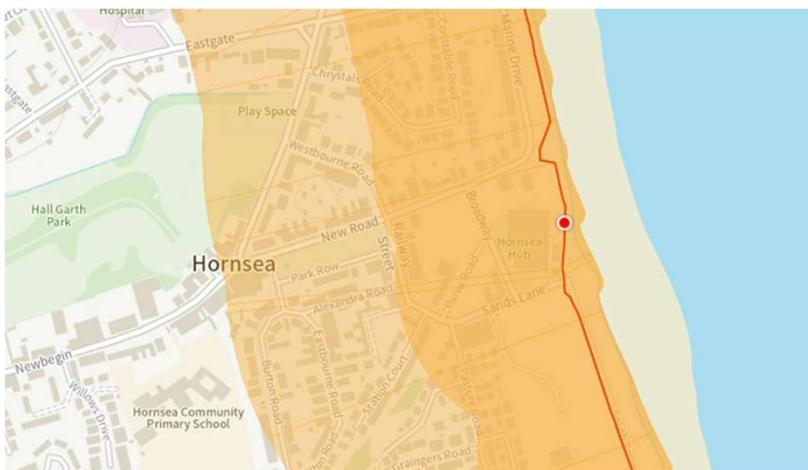
Under the hood...



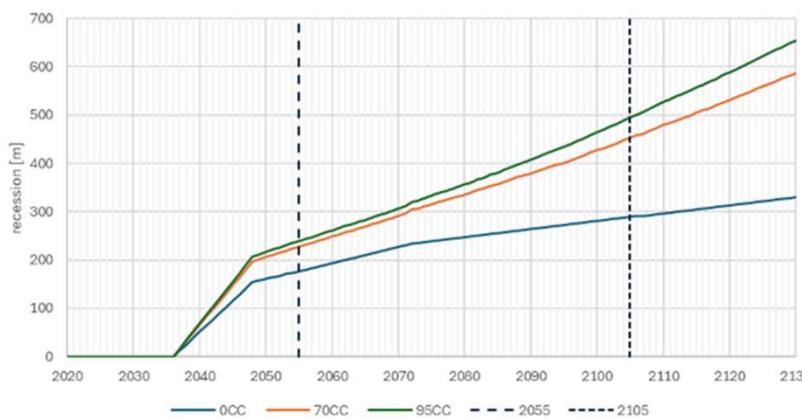
Under the hood...

- “Underlying Rate” based on historical data
- Projected using climate change (cliff vs non-cliff)
- If defended: defence deterioration + SMP policy = probability of failure
- Special consideration of accelerated retreat if defence fails
- Robust verification with local authorities:
 - Provide local data
 - Review interim outputs (underlying rates / defence performance)
 - Review draft outputs
 - Representation in Steering Group

Available Outputs



- SMP Explorer – online, open to the public
 - SMP Delivered **vs** No Future Intervention
 - No climate change **vs** UKCP RCP8.5 70th **vs** UKCP RCP8.5 95th
 - 2055 & 2105
- Professional Partners Product:
 - Full recession timeseries
 - All model inputs

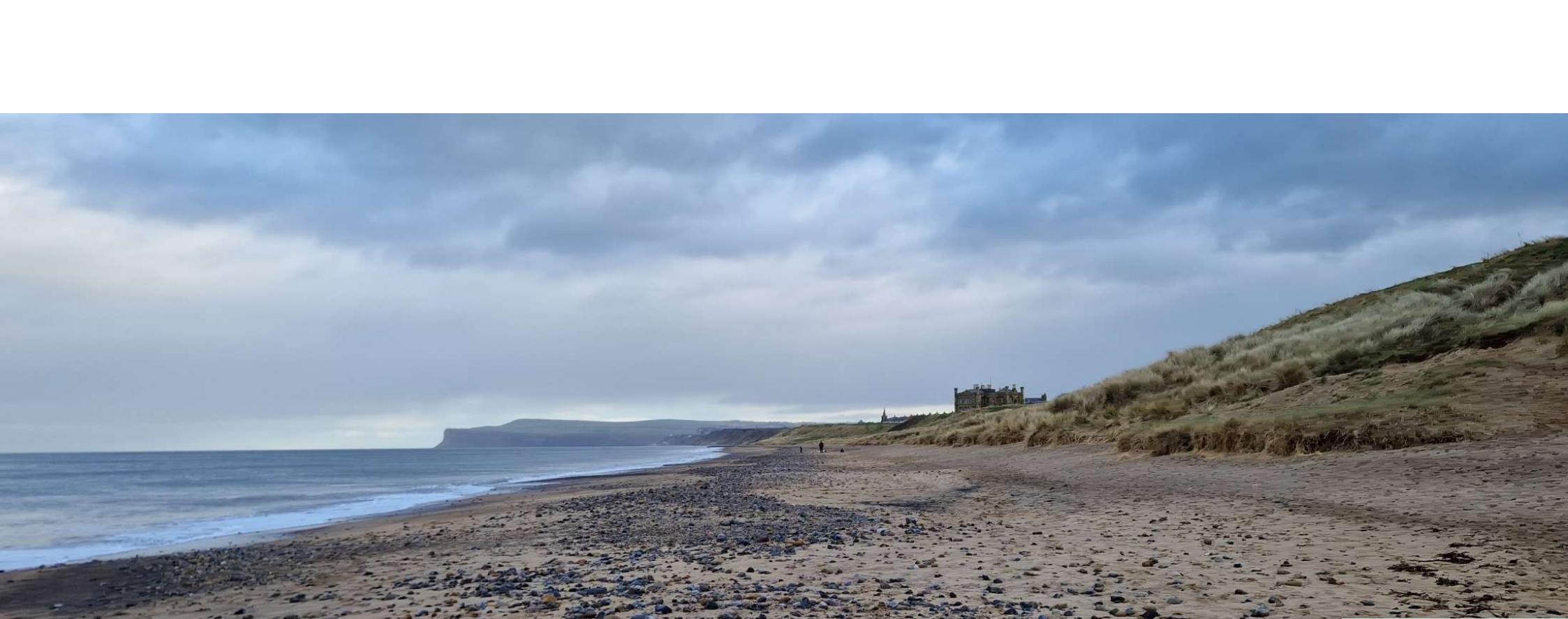


NCERM2 ↔ Dynamic Coast



- Prediction methods:
 - Sandy coastlines: similar to Dynamic Coasts
 - Soft cliff coastlines: regionalised physics-based modelling (SCAPE)
- Heterogenous geomorphology (non-erodible)
- Defence performance
 - Deterioration
 - Policy
- Verification with local authorities – Dynamic Coast 2.1

key elements in NCERM;
“more constrained” limits



@

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in

[linkedin.com/in/rmborsje/](https://www.linkedin.com/in/rmborsje/)



We are hiring!



Jacobs



Lessons learned from Applying CCAP Guidance

Abbie Jenkins, AtkinsRéalis

John Lavery, Mott MacDonald

Doug Pender, JBA Consulting

Flood Resilience Conference 2026

Lessons learned from applying CCAP
Guidance

Abbie Jenkins – AtkinsRéalis

John Lavery – Mott MacDonald

Doug Pender – JBA Consulting



Policy Context

UK Climate Change Risk Assessment (CCRA3) - Scotland Key Findings

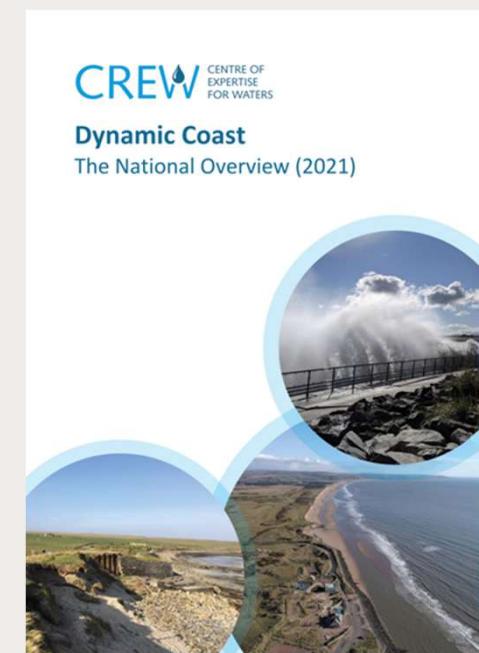
Coastal Risk Overview

- 19% of Scotland's coastline is potentially erodible.
- At least £20bn of roads, rail and residential property lie at the coast. £15bn of these are behind erodible shores, with £5bn protected by artificial defences.



Need for Enhanced Action

- Future coastal change requires new, stronger or different Government action
- Emphasis on long-term, proactive risk management
- Recommendations included adaptation pathways approach to allow flexible responses to be explored in the face of uncertainty.



Scottish Government Guidance

- Coastal Change Adaptation Plan Guidance published to support local authorities in planning for future coastal climate impacts
- Aims to strengthen long-term resilience of coastal communities
- Guidance supported by wider legislation and policy, including Scottish National Adaptation Plan and National Planning Framework 4 (NPF4)

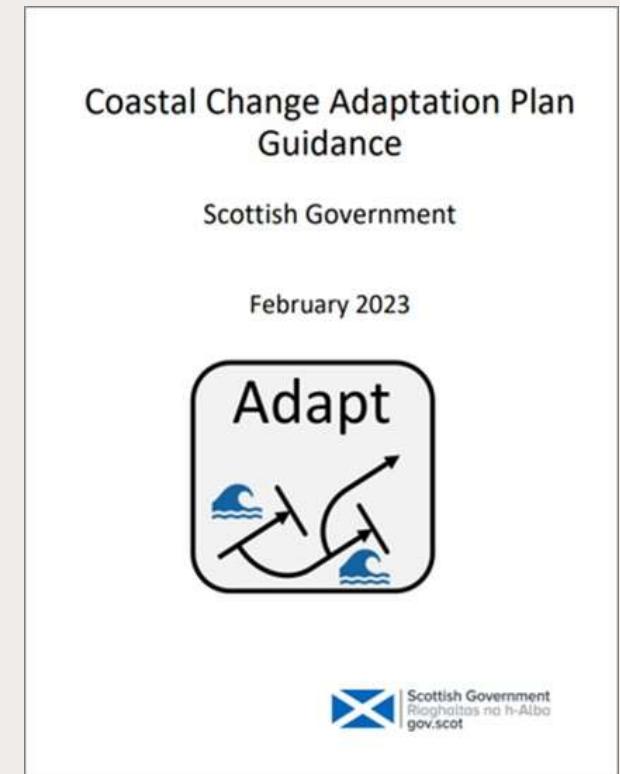
Coastal Change Adaptation Plan (CCAPs)

What is a Coastal Change Adaptation Plan?

- Strategic framework for managing coastal communities and environments
- Sets out policies to address coastal erosion and flooding
- Guides long-term resilience and climate adaptation efforts
- Supports sustainable decision-making for future coastal change

Why do you need a Coastal Change Adaptation Plan?

- Coastal areas face increasing risks from sea-level rise, flooding, erosion and erosion enhanced flooding
- Proactive adaptation reduces long-term costs and constraints
- Helps local authorities plan effectively for future climate impacts
- Supported by Scottish Government CCAP Guidance to strengthen statutory coastal planning
- Ensures long-term resilience of coastal communities



Coastal Change Adaptation Plans (CCAPs)

Statutory Requirement

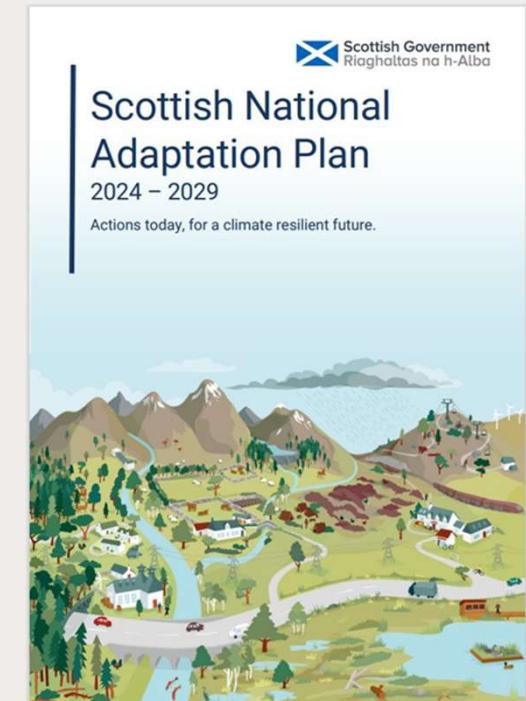
- Scotland's 24 coastal Local Authorities are required to produce a CCAP to plan for rising sea levels and increased coastal erosion.

Shared Responsibility

- National and local government, businesses, and landowners with coastal responsibilities must support Local Authorities in developing and delivering CCAPs.

Role of Consultants and Local Authorities

- Local Authorities are the lead bodies responsible for preparing and implementing Coastal Change Adaptation Plans.
- Consultants provide specialist technical expertise to support Local Authorities in developing robust, evidence-based adaptation plans.



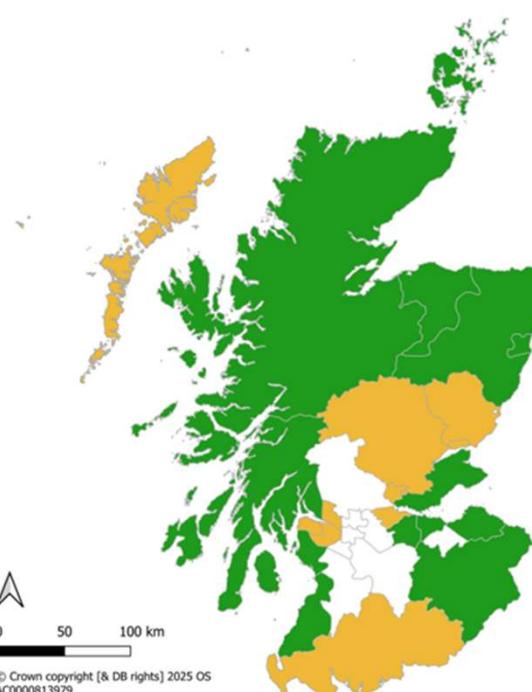
Flexible Approach

- Scottish Government interim guidance helps local authorities and their partners meet their statutory functions and strengthen long-term adaptation and coastal resilience.

Use of CCAP guidance

Local Authorities who have used CCAP Guidance or have a SMP.

LA use of CCA Guidance [32]
■ Yes [13]
■ Not yet [11]
■ Not coastal [8]



- SMPs have had a somewhat sporadic and inconsistent history across Scotland.
- CCAPs are starting to become more embedded practice with the majority of coastal Local Authorities using the guidance in some form.
- The following slides summarise and showcase key lessons learned and challenges from guidance application across recent and ongoing work.
- This includes:
 - Orkney Islands
 - Moray
 - Aberdeenshire
 - West Lothian
 - City of Edinburgh
 - Scottish Borders
 - Ballantrae (South Ayrshire)

Where has CCAP guidance been applied in Scotland?

Orkney Islands Coastal Adaptation Plan

20

Inhabited Isles
across the
archipelago

1,200

kilometres
MHW in OS
boundary line

1

UNESCO
World Heritage
Site on an
eroding coast

21

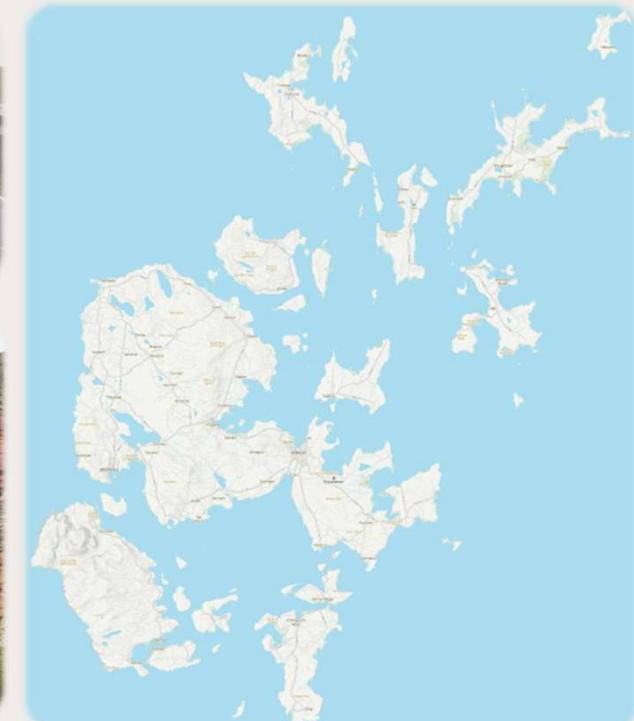
Ports
Operated by
Orkney Ferries
between Islands

22,000

people
2022 census

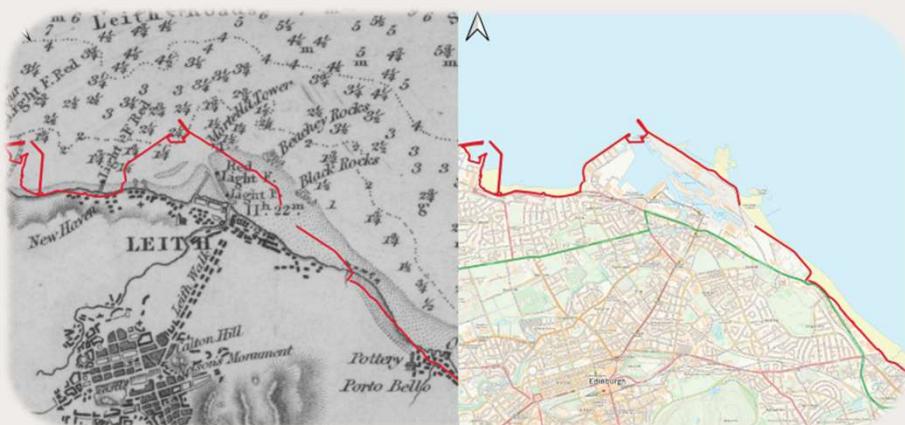
8

Potentially
Vulnerable Areas
in SEPA 2022-
2028 plan



Where has CCAP guidance been applied in Scotland?

City of Edinburgh Coastal Adaptation Plan



£37bn

Gross
Domestic
Product
(ONS, 2023)

41

kilometres
MHW in OS
boundary line

4

Special
Protection
Areas



3

crossings
of the Firth of
Forth

523k

People
(ONS, 2023)

14

Scheduled
monuments
along the
coastline

Where has CCAP guidance been applied in Scotland?

Scottish Borders Coastal Adaptation Plan

1st

IUGS
Geological
Heritage site
Siccar Point

56

Kilometres
MHW in OS
boundary line

5km

East Coast
Mainline
in the coastal
zone of influence

2%

Population
of Scotland living
in Scottish
Borders Council
area

AtkinsRéalis

M
MOTT
MACDONALD

JBA
consulting

5

Populated
Places on the
coast

9

Coastal
Management
Units



Where has CCAP guidance been applied in Scotland?

Aberdeenshire Coastal Change Adaptation Plans



4
Coastal
Council
Committee
Areas

300
Properties
influenced by
coastal erosion
by 2100

300
Kilometres of
coastline

22
Coastal
Community
Councils

30
Kilometres of
coastal
structures

1
Regional
CCAP

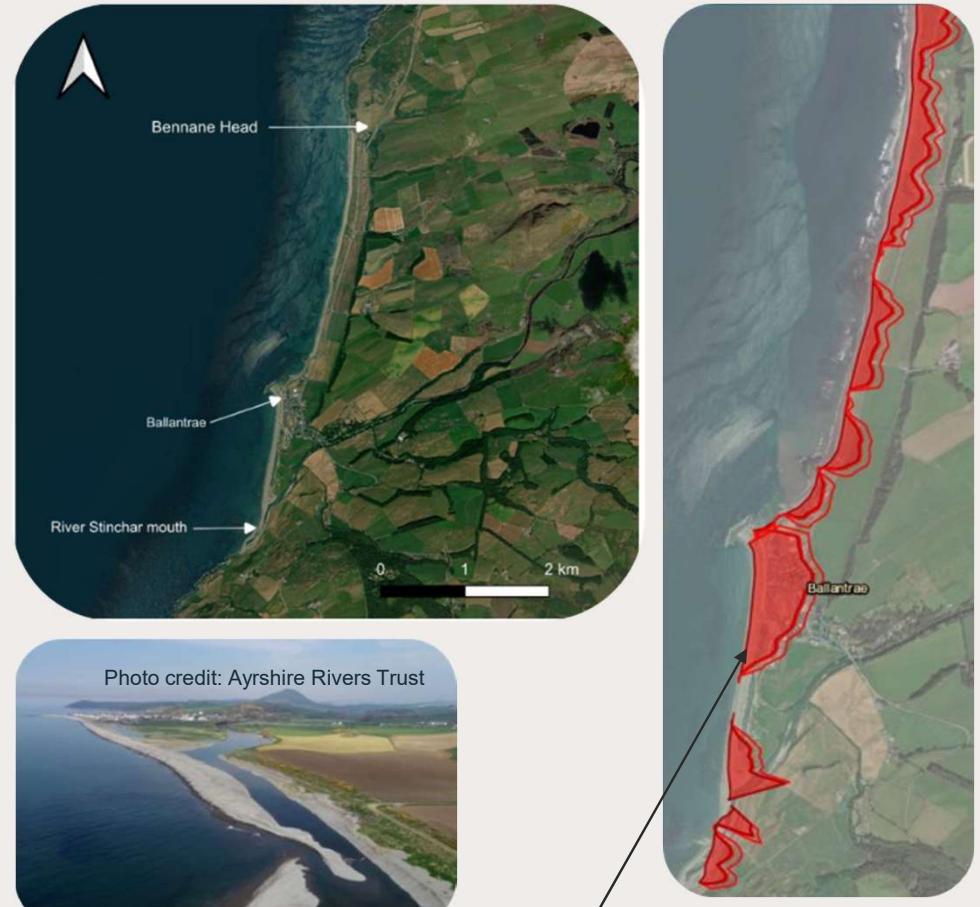
900
Properties at
risk of coastal
flooding by
2100

20
Local
CCAPs

Where has CCAP guidance been applied in Scotland?

Ballantrae Coastal Adaptation Plan

- South Ayrshire Council and Ayrshire Roads Alliance with support from Nature Scot.
- Ballantrae village, nature conservation sites (Ballantrae Shingle Beach SSSI) and strategically important infrastructure (A77 trunk road providing link to ferry ports) are at risk.
- A locally focussed project was needed to improve **understanding of coastal change** and increase confidence of risks to people and places.



Predicted erosion by 2100 for UKCP18 RCP8.5 95th percentile scenario

Where has CCAP guidance been applied in Scotland?

West Lothian Coastal Adaptation Plan

- West Lothian Council.
- Firth of Forth Ramsar, SPA and SSSI along coast.
- High percentage of coastline designated for its historical significance with Hopetoun House Estate.
- Approx 3% of Scottish population in West Lothian



Emerging lessons

Data

Local geography

Governance



Lessons Learnt – Data challenges

Lack of Baseline Data

- Insufficient information to understand current conditions, making change difficult to measure.
- Incomplete understanding of local risk.
- Regions lack high-resolution data on sea level rise, storm surge, erosion and subsidence.

Ballantrae CCAP

- Early-stage qualitative data during initial phase.
- Unrealistic to develop complete understanding of rate of coastal change before considering adaptation.
- Evidence base continually evolves to refine adaptation plan based on phase 2 monitoring outputs.



Uncertainty must be built into adaptation pathways. Coastal change is dynamic, and evidence gaps are unavoidable, and plans must explicitly acknowledge uncertainty and remain flexible and iterative. Adaptive pathways help manage risk even when data is incomplete.

Lessons Learnt – Data challenges

Large Coastal Area

- Extensive coastline increases data demands.
- Cleaning, organising, and reviewing large datasets takes far longer than anticipated, especially when quality varies.
- Conditions can change dramatically along the coastline, meaning one-size-fits-all assessments don't work, and localised analysis is essential.

Orkney CCAP

- 1,200 km MHW in OS boundary line generating large volume of data.
- Varied conditions from one island to another.
- Substantial time organisation and analysing coastline.
- Complex to navigate hierarchies of environmental classifications and local choice.



Lessons Learnt – Data challenges

Data ownership and understanding

- Delivery of CCAPs requires ownership and understanding of the **data that informs key decisions**.
- For critical Triggers, Thresholds and Decision-Points on pathways you **cannot wait to have all of perfect data provided**.
- Processes and data need to be **developed, steered and owned by LAs** to ultimately deliver Adaptation Pathways.

Ongoing Examples

- Aberdeenshire Council – How to create and embed Coastal Change Management Areas into planning policy.
- Moray Council – How to continually monitoring coastal change, dynamically assess risk and link to Pathway Triggers.

Scottish Borders Berwickshire CCAP

- Hard coast with pocket beaches and communities.
- 56 km MHW in OS boundary line
- Adaptive pathways under development.
- Data rich but significant areas for interpretation and choice.

Data and decision making

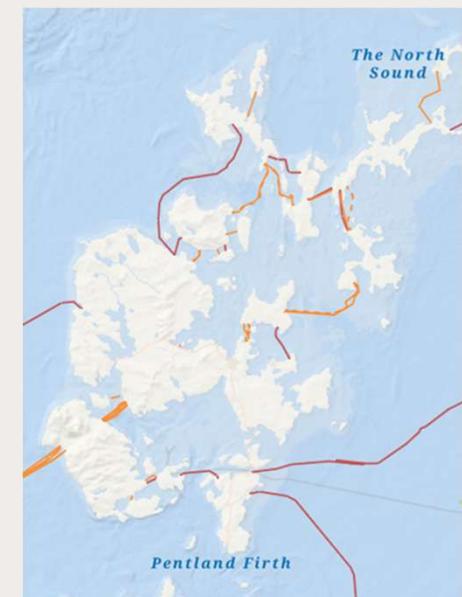
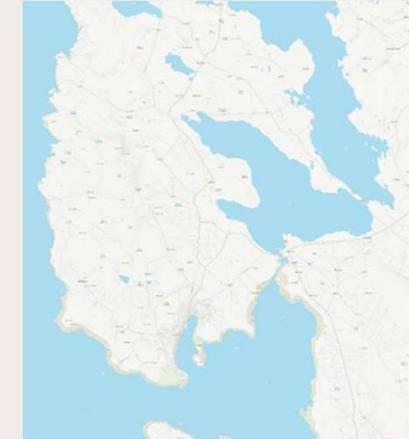
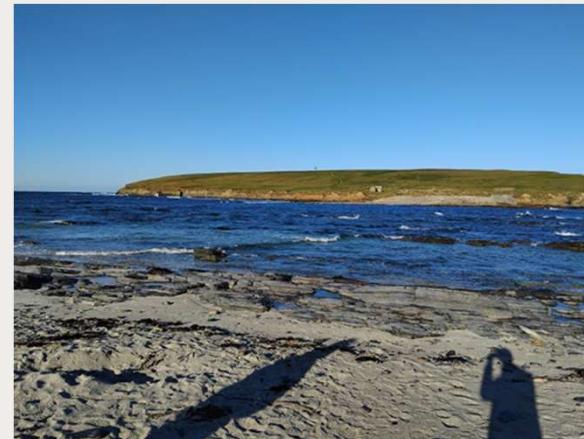
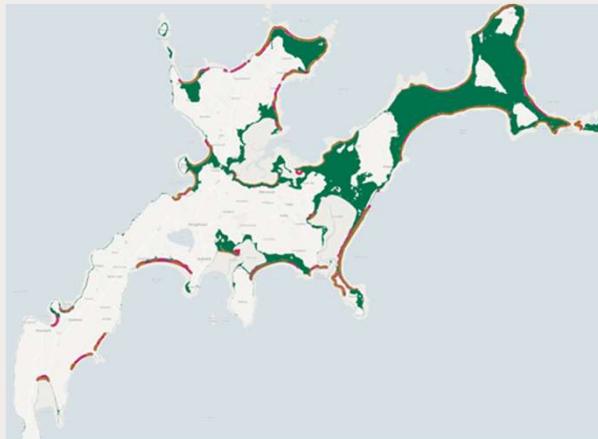
- Whilst data informs key decisions, **data cannot replace decision-making**.
- Local Authorities and consultants need to be clear about **the role of preference and judgement** in the plan.
- **Evidencing policy selection** must be supported by data and process (see governance).

Lessons learnt – local geography

The burden of geography

- Some local authorities have more coast than others, and economies of scale may be hard to realise.
- Island geographies have specific and complex needs due to critical themes of:
 - ✓ Multi-directional constraints
 - ✓ Relative remoteness
 - ✓ Inter and intra-island connectivity
- Indirect threats to geographical sites of may require special consideration
 - Increased salinity
 - Increased tide locking
 - Loss of tide limited access e.g.

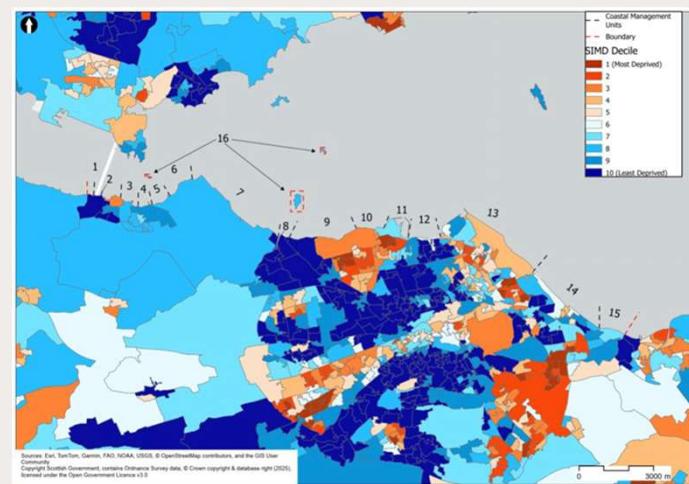
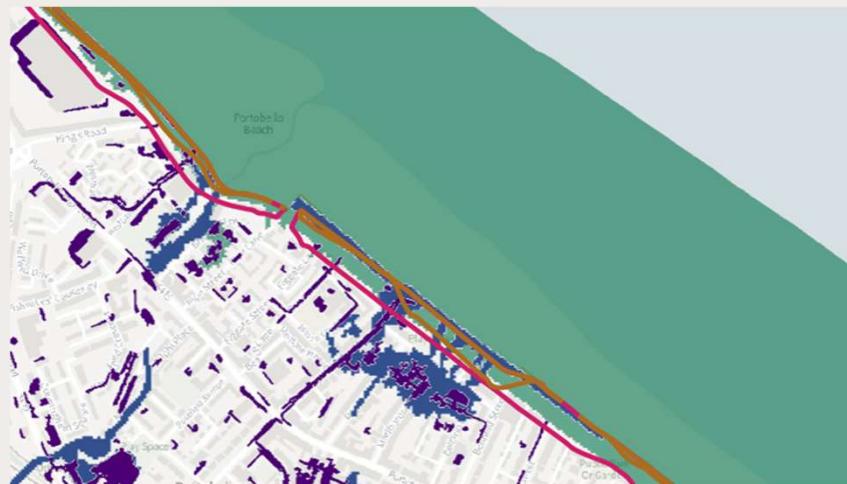
Edinburgh	Scottish Borders	Orkney
41km	56km	1,200km



Lessons learnt – local geography

Geographical variation and trends

- **Proportionate** approaches are needed for all plans.
 - Density of data/assets/interests
 - Sparse and large geographic extents
- **Common approaches** to “types” of coast may be identified – could this be expanded to support a proportionate approach?
- **Socio economic analysis:** variability in approaches across CCAPs.
- Local geographies may drive the **interfaces between plans**; this can affect governance and sequencing of plans across Local Authorities.



Lessons learnt – local geography

Local geography must inform data interpretation

- Similar or the same data sources are used across most CCAPs.
- How they are interpreted, weighted and embedded into decisions varies depending on local geography
 - **This is Ok!**
- It is important to recognise the local geography characteristics to create opportunities, not just identify constraints and risk.
- Usage of the same data sources must be complimentary to regional and local objectives across local authority departments and initiatives – see Governance.

Examples

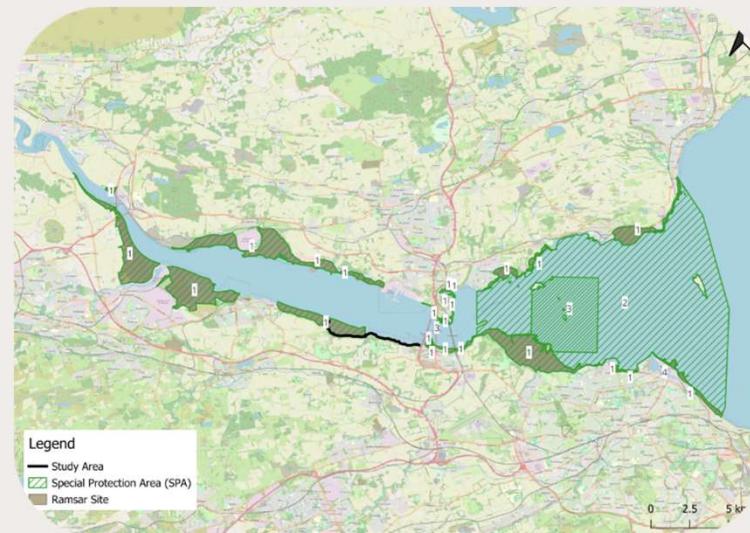
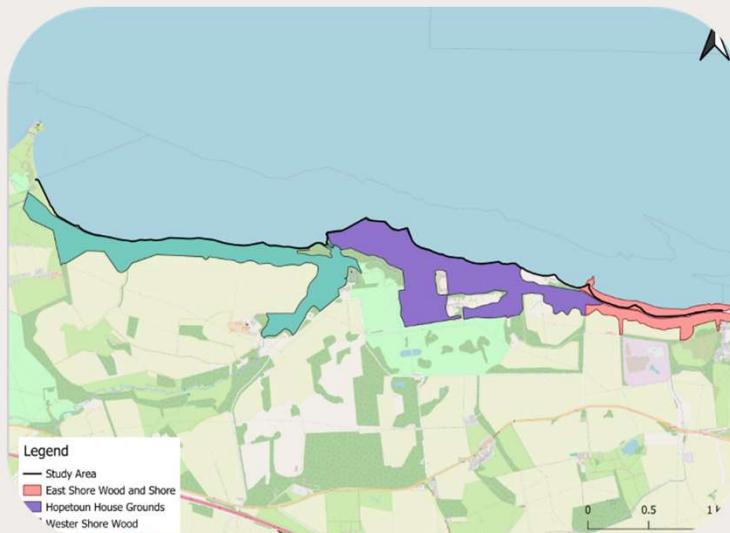
- Socio – economic data can be used to identify wider (non-risk management) adaptation opportunities as well as understand risk.
- Data on development investment can be used to direct CCAP effort and actions –or vice versa.

Lessons learnt – local geography

Variation of local geography in CCAP

West Lothian

- Dominance of the coastline is environmental designations and not protection of the residential or commercial properties.
- Coastline is approx. 5 miles so very small scale
- Limited infrastructure.
- Plan potentially used to enhance biodiversity.



Lessons learnt – local geography & place

Data cannot be the whole story

- Data on the geography of a study area is always partial.
- Yet, trends and common approaches can be identified.
- Constructive adaptation that is mindful of place must go further than data alone.

Adaptation, defence, growth, and hope

- Engagement with local geography interacts strongly with local communities.
- Starting from existing physical geography facing erosion or inundation, adaptation may be unduly focussed on existing uses.
- Engagement with Local Place Plans and with Community Councils to understand future geographies, and future infrastructure informs the “longer term (most sustainable position)” [cf. CCAPG, 2023].

Place and ownership

- Data led approaches can be useful for consultants and authorities
- They can also be remote / disempowering for communities.

The Place Principle recognises that:

- Place is where people, location and resources combine to create a sense of identity and purpose, and is at the heart of addressing the needs and realising the full potential of communities. Places are shaped by the way resources, services and assets are directed and used by the people who live in and invest in them
- A more joined-up, collaborative, and participative approach to services, land and buildings, across all sectors within a place, enables better outcomes for everyone and increased opportunities for people and communities to shape their own lives.

Lessons learnt - Infrastructure

Large-scale third-party assets

- Third party readiness for climate change varies.
- Can dominate large parts of the plan during development and execution.
- Early engagement of asset owners is essential.

Connectivity as a challenge

- Connectivity creates complex links between CCAPs.
- This can be managed via triggers.
- Potential to significantly complicate into the future due to energy transition.



Lessons Learnt – Governance

What does a CCAP promote?

- Shift from “*protection-only*” to a flexible and forward-looking approach focusing on climate resilience.
- Promotion of “*making space*” for natural processes.
- Actions should follow a “*place-based*” approach.
- Changes need continual monitoring and review with future actions taken “*when needed*”.

Different ownerships, different outcomes?

- Is a CCAP a planning or a risk management strategy?
- With different ownership would you get a different outcome?
- How does it fit within wider resilience, adaptation and FRM initiatives?
- Are there risks of conflicts and confusion?

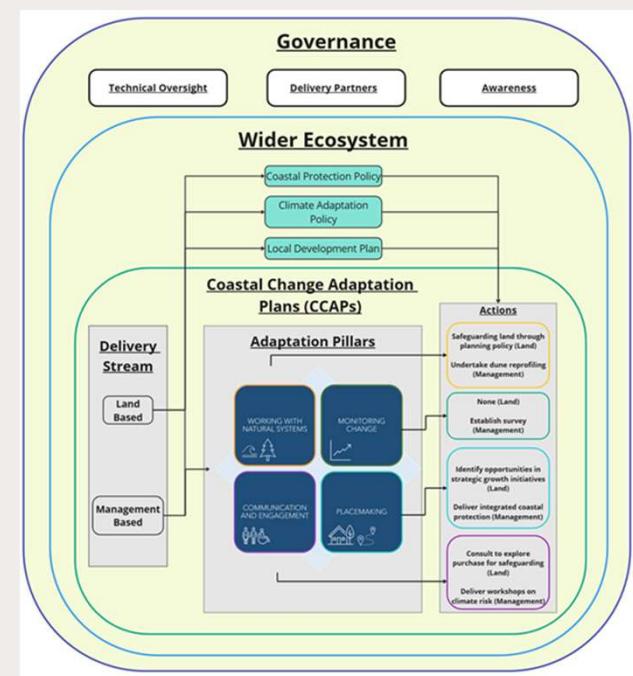


Avoid wrong decisions in the long term and **prioritise right decisions** in the short-term

Lessons Learnt – Governance

A basic structure

- Clear and effective **Governance**
- Complementary wider **Ecosystem**
- Simple interpretation of Scot Gov ambitions to deliver balanced actions across key **Adaptation Pillars**
- Streamlined delivery through **Land and Management-based Practices**



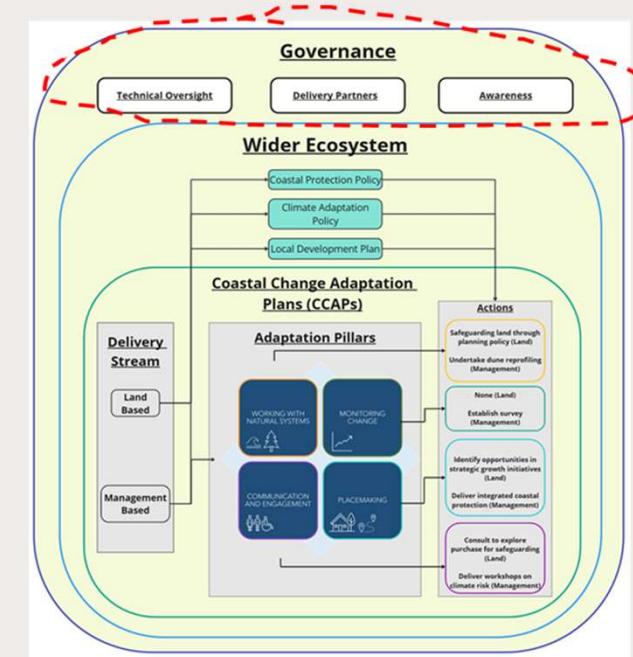
Lessons Learnt – Governance

What is important in CCAP governance?

- **MUST** align with and inform existing Council strategies and plans to support to deliver a consistent, streamlined approach.
- Conflicts **MUST** be avoided to ensure efficient, coordinated use of resources for common goals.
- Delivery needs a council-wide collaboration
 - Unlock funding
 - Consistent messaging
 - Maximise resource efficiencies
 - Effective budgeting

What approach could be taken?

- A simple and consistent framework to guide adaptation actions and decisions.
- Flexible, and adaptable for different organisations.
- Core components that can be translated to any organisation.



Lessons Learnt – Governance

What is a CCAP Ecosystem?

- In any organisation there will be similar plans, strategies and agendas on "resilience".
- These are all not necessarily related to climate and could be operational.
- Similar principles, terminology and delivery approaches will apply.
- The interconnected system of plans, policies, priorities, and projects that overlap with the CCAP.
- Critical links and information exchanges need established.

Why is it important?

- To avoid conflicts.
- To promote consistency.
- To streamline delivery.
- To avoid mixed messaging.
- To share knowledge.
- To maximise impact of CCAP actions.



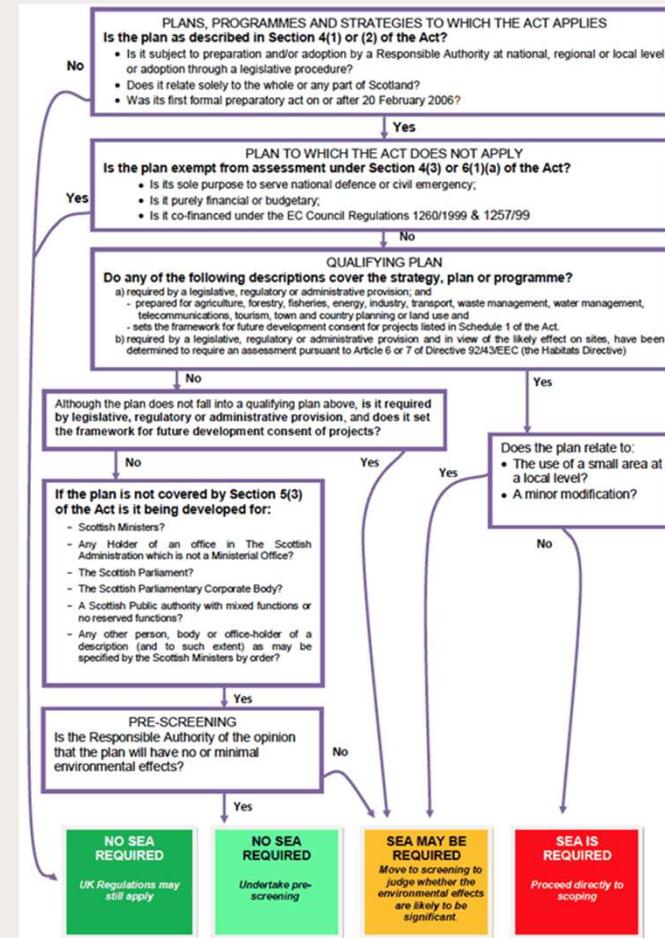
Lessons Learnt – Governance

Associated plans to support the CCAP

- Strategic Environmental Assessment
- Habitats Regulations Assessment
- Islands impact assessments
- Equality impact assessments / integrated impact assessments

Interacting council plans with the CCAP

- Other flood risk management plans (SWMP, RBMP etc)
- Local Place Plans
- Local Development Plans
- Others...?
 - Harbour masterplanning



Lessons Learnt – Governance

What are Adaptation Pillars?

- A simplification of the Scot Gov climate adaptation vision
- A mechanism to support and identify actions.
- Critical links and information exchanges need established.

Why are they important?

- To enable and support a balanced approach to CCAP delivery.
- To give confidence and demonstrate organisations are "*doing adaptation*".
- To promote consistency.
- To streamline delivery.
- To respond effectively to funding opportunities.
- To make efficient and effective use of budget and resource.



Lessons Learnt – Governance

Governance to Action Delivery

- What is the action?
- Who is responsible for delivery?
- Who is supporting delivery?
- What Pillars are relevant?

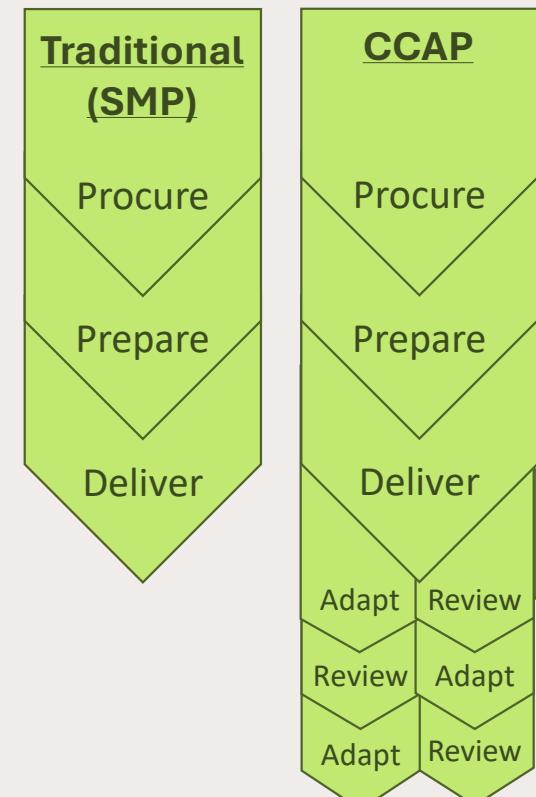
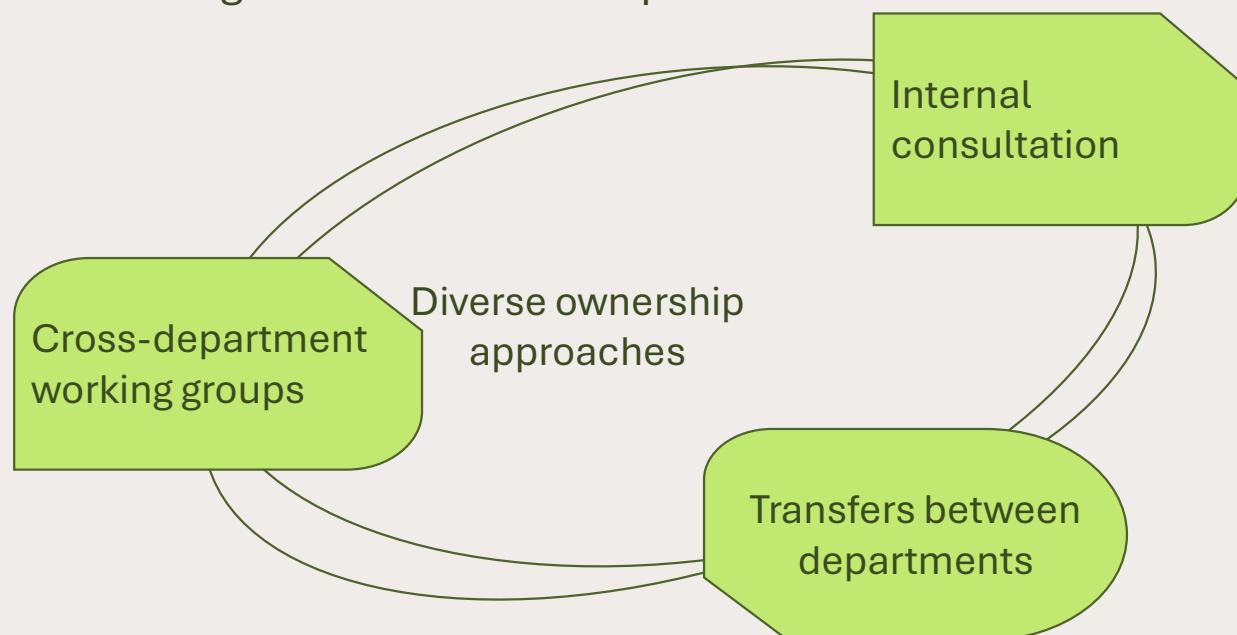
Action	Details	Delivery Stream	Adaptation Pillars
R1	Confirm CCAG and overarching CCAP governance structure.	Both	All
R2	Undertake economic opportunities review to identified critical third-party private sector stakeholders and sources of funding.	Both	All
R3	Undertake engagement with private sector stakeholders to understand opportunities for funding or mixed investment.	Both	All
R4	Establish coordinated and consistent coastal change monitoring plan for the Aberdeenshire Region.	Management	Monitoring Change
R5	Establish and standardise defence asset condition database, including a mechanism for updating this and for identifying Triggers in advance.	Management	Monitoring Change
R6	Coastal adaptation workshop with East Grampian Coastal Partnership.	Management	Communication and Engagement
R7	Engage with NESCAN to understand opportunities for partnership working.	Management	Communication and Engagement
R8	Review Local CCAP outcomes with a view to apply for Scottish Government coastal change adaptation funding to deliver Actions, if available.	Both	All
R9	Review Regional and Local CCAP findings against LDP and defined development opportunities.	Land	Placemaking
R10	Establish defined CCMAs, development constraints and integrate into LDP policies.	Land	Working with Natural Processes Placemaking
R11	Undertake strategic evaluation and appraisal of impacts of erosion and flooding on road and community connectivity across Aberdeenshire.	Management	Placemaking
R12	Identify and agree a reporting process with Aberdeenshire Council committees	Both	All

Action	Details	Pillars
1	Undertaken NBS opportunities mapping exercise at the coast and land adjacent to the current coast-land boundary	Working with Natural Processes
2	Establish coordinated and consistent coastal change monitoring plan for Moray Region.	
3	Establish and standardise defence asset condition database, including a mechanism for updating this and for identifying triggers in advance.	Monitoring Change
4	Coastal adaptation workshop with Moray Coastal Partnership	
5	Engagement workshop with key third-party stakeholders. Utilities companies, private marinas, coastal asset owners, golf clubs etc.	Community and Engagement
6	Coastal flood forecasting refresher workshop with SEPA	
7	Undertake land use opportunities mapping exercise	Place Making
8	Undertake economic opportunities exercise	

Lessons Learnt – Governance

Ownership through the life cycle

- “Traditionally” owned by engineering/flood risk teams in councils.
- CCAPG (2023) emphasises planning and the planning authority function.
- How do developers and communities interact with the plan?
- How to leverage diverse internal expertise inside councils



Panel discussion

- Lee Watson, Aberdeenshire Council
- Scott Greig, Ayrshire Roads Alliance
- Peter Woodward, Orkney Islands Council



Panel Discussion

Chair: Ali Rennie, NatureScot

Peter Woodward, Orkney Islands Council

Scott Greig, Ayrshire Roads Alliance

Lee Watson, Aberdeenshire Council

venture



Scan the QR code with your phone or tablet camera

OR

Log into a web browser and enter – www.slido.com and enter Floodresilience2026 in the box with 'enter code here'

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 #Floodresilience2026

 Scottish Government
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Lunch, Market Place and Networking

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Flood Resilience Conference 2026

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Scotland's Flood Resilience Conference 2026

Parallel Session A – Property Flood Resilience

Chair: Kelly Ostler-Coyle, Flood Re



Why Household Flood Resilience (and insurance) matters

Jonathan Kassian
Flood Re



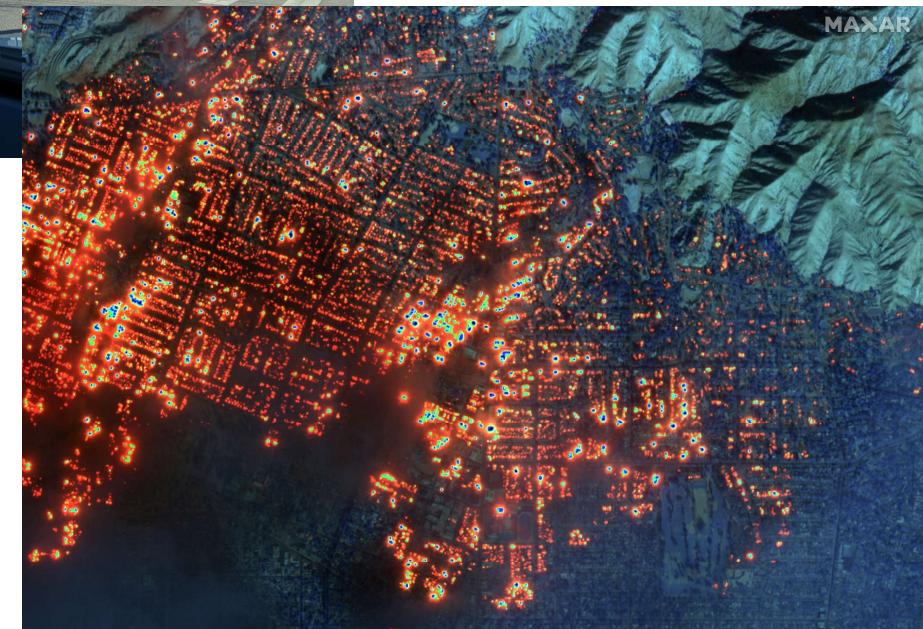
Why Household Flood Resilience (and insurance) matters

Verture Conference, January 26, 2026



Global Context – Insurance & Household Resilience

FLOODRE



Global Context – Insurance & Household Resilience

FLOODRE



Mass evacuations in Los Angeles as deadly wildfires wreak havoc



Rescue efforts hindered by windstorms fanning 'unprecedented' blazes

Oliver Holmes
Dani Anguiano and
Gabrielle Canon, Los Angeles

Fast-moving wildfires have torn through several neighbourhoods

described as among the 'most devastating and terrifying nights' in the city's history.

By the morning, the authorities had dispatched fire fighters from across California to aid in tackling the blazes in the city.

The disaster began on Tuesday, when a powerful windstorm fanned the flames of a fire in the scenic Pacific Palisades neighbourhood.

About 20,000 people were ordered to evacuate their homes, and more

windstorms affecting a large swath of southern California.

Evacuation parts of Los Angeles, the evacuation parts have been frenzied as residents rush to the few roads leading out of the city.

The flames were moving so quickly in some areas that residents were forced to abandon cars and flee on foot. In one neighbourhood, officials said emergency services had to clear a road in order to get through.

In the Pacific Palisades,

Meta's new rules set up clash with UK and EU

Robert Booth
Dan Milmo
Jennifer Rubin

to scrap factcheckers in the US for Facebook, Instagram and Threads, was one labelling it "tripplanning".

Changes to the rules of how factcheckers can deal with hateful content now include

allowing users to call transgender people "transgender" and "trans" and to allow allegations of mental illness or abnormality when based on gender or sexual orientation.

Politicians in Brussels and London criticised Mark Zuckerberg's decision

and technology companies, which is investigating how online disinformation fuelled last summer's riots, with one labelling it "tripplanning".

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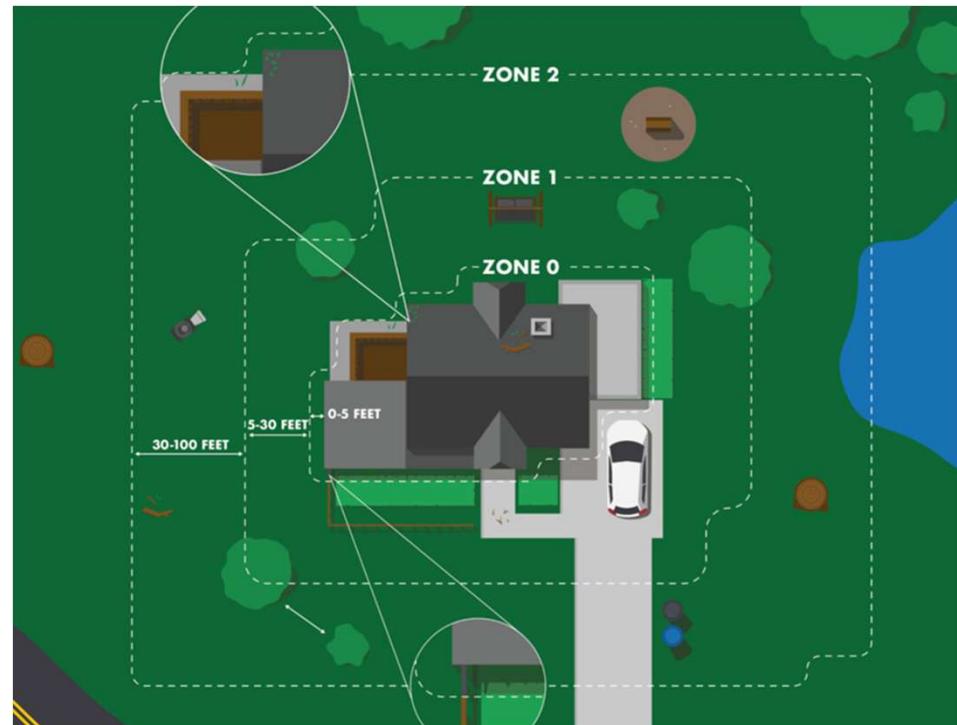
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Global Context – Insurance & Household Resilience

FLOODRE



Global Context – Insurance & Household Resilience

FLOODRE



- 14 October 2025



REDUCING FLOOD RISK: WHICH HOMES ARE MOST SUITABLE FOR PROPERTY FLOOD RESILIENCE?

Findings from National and Area-Specific Analysis

- *Dr Amicia Lee, Ian Millinship - JBA Risk Management*



CONTEXT & AIMS

6.4 million

~1 in 5 homes face flood risk



**AT RISK OF
FLOODING**

£1.4 billion

Annual average cost of flooding



4 million

Properties protected by
formal flood defence



83%

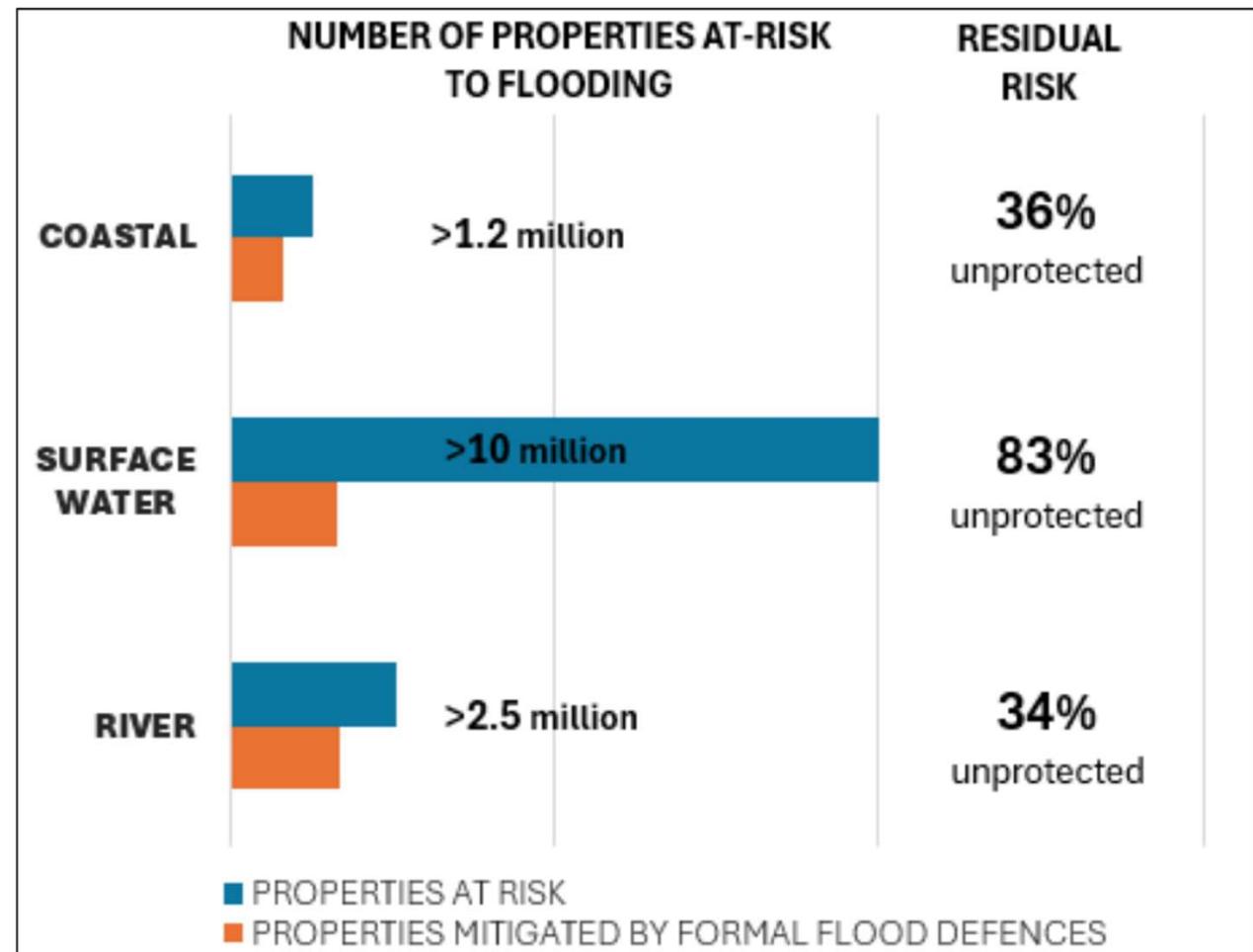
Of properties at risk to
surface water flooding
unprotected or with
inadequate drainage



+12-14%

Increase in sub daily
rainfall rates under 1°C
warming

CONTEXT & AIMS



CONTEXT & AIMS



Property Flood Resilience (PFR) can protect homes from water up to 60cm deep entering the property



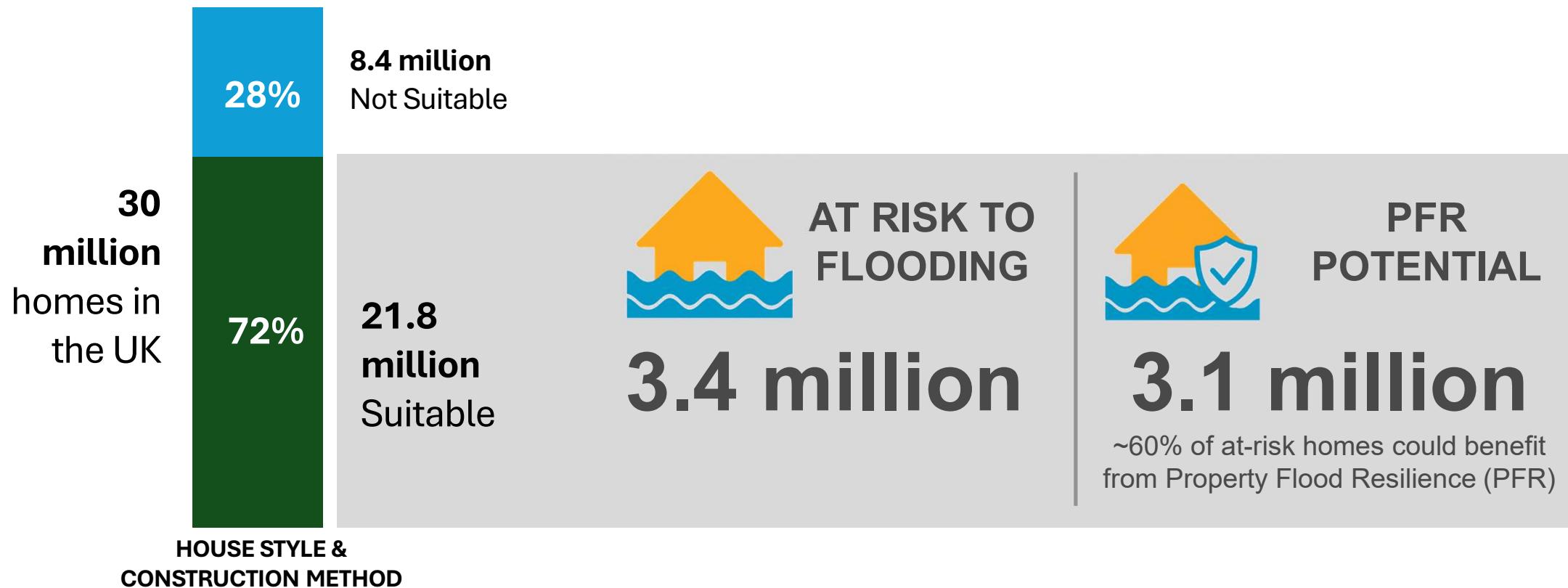
Project aims:

- Which homes are most suitable for PFR? & what are the installation costs?
- Where and when is PFR cost-effective?
- How might this differ in different parts of the country?
- What are the social and financial factors affecting uptake?

NATIONAL FINDINGS

HOMES SUITABLE FOR PFR

- PFR can be applied to a wide variety of homes



PFR INSTALLATION COSTS

Limited Resistance PFR Package

£1,500-£4,500

Homes at risk to flooding up to threshold height (**0.15m**)

Standard Resistance PFR Package

£7,000-£15,000

Homes at risk of shallow, occasional flooding (**0.6m**)

Comprehensive Resilience Retrofit

£10,000-£30,000+

Properties with previous flooding or in medium to high risk zones (**0.6m**)

- Cost vary by level of flood protection, size and house style

PFR UPTAKE SCENARIOS

IF PFR APPLIED TO ALL HOMES OF SUITABLE CONSTRUCTION TYPE



3.1 million
properties

IF PFR APPLIED TO ALL HOMES AT RISK OF FREQUENT FLOODING



115,000
properties

£238 million

Could be saved if PFR is applied to properties with a 2% risk of flooding

IF PFR APPLIED TO ALL HOMES WHERE COST EFFECTIVE



Limited PFR measures
51,000 properties

£54 million

Potential saving



Standard PFR measures

113,000 properties

£213 million

Potential saving

CASE STUDY AREAS

CASE STUDY AREAS

Kensington & Chelsea

Densely populated, high-value urban borough, heavily affected by surface water flooding in 2021. Represents an affluent community with complex infrastructure and drainage challenges.

Hull, Yorkshire

A less affluent urban area with extensive flood exposure, highlighted during the 2007 floods. Potential socio-economic and infrastructure challenges in flood resilience.

West Lothian, Scotland

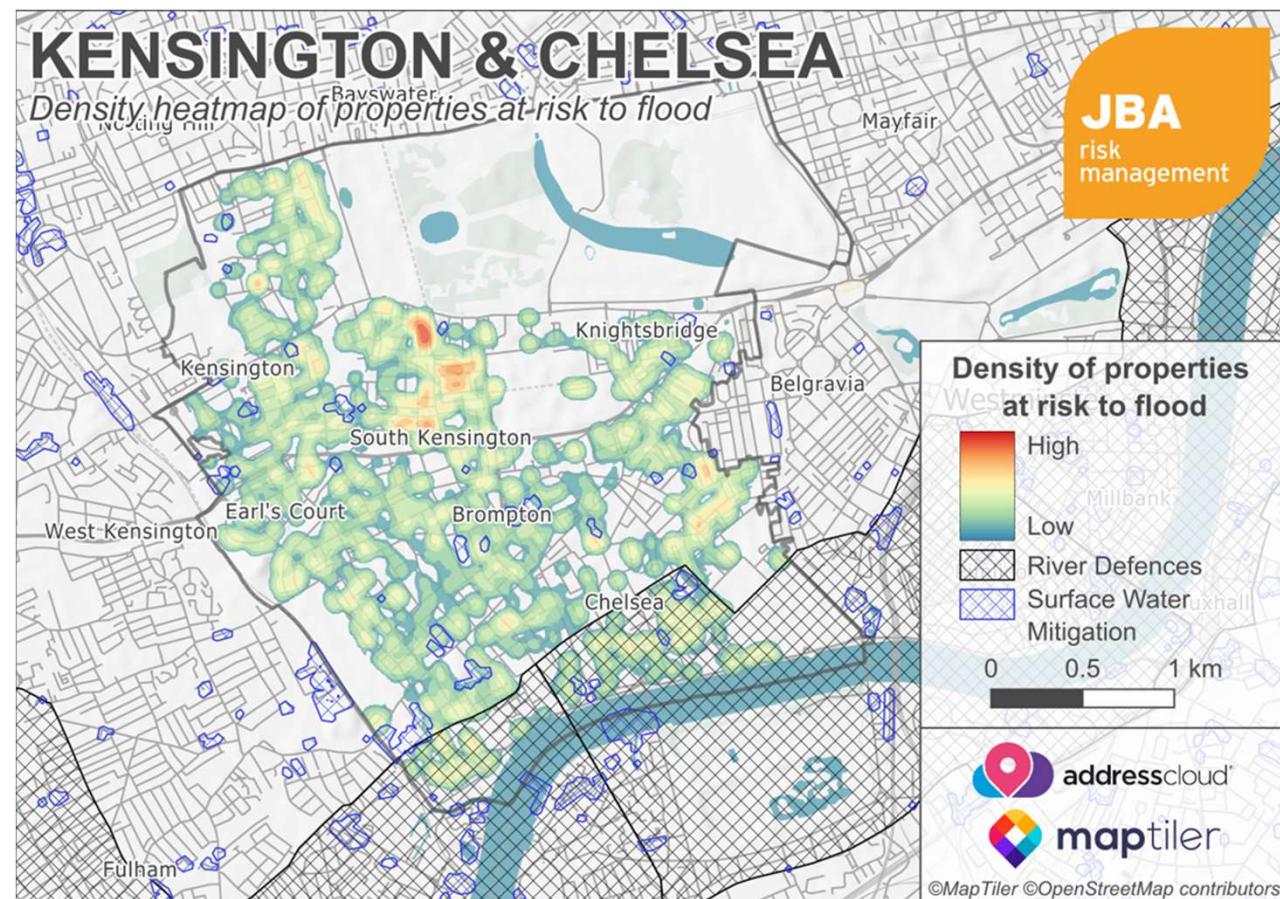
A semi-urban area with frequent flood hotspots. Already piloting a PFR scheme, providing lessons for early implementation and future scaling.

Pontypridd, Wales

A river valley community hit hard by Storm Dennis in 2020 & Storm Bert 2024. Features older housing stock and evolving resilience needs.

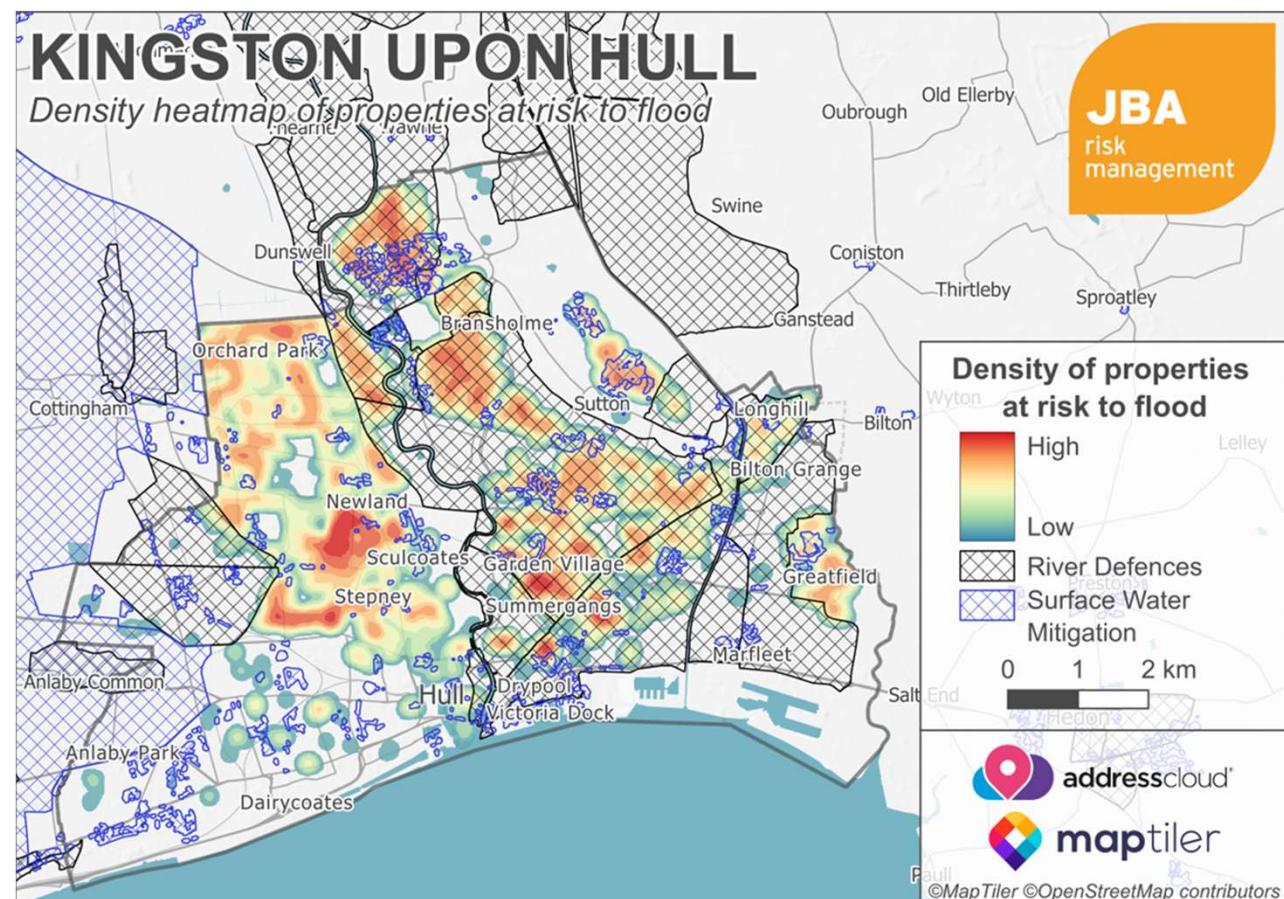
KENSINGTON & CHELSEA

- **High risk from surface water** due to dense urban form and ageing drains.
- **46% of homes suitable for PFR**, including 2,500 basement and 12,500 ground-floor flats.
- **£3.9m/year savings** possible (67% AAL reduction).
- **60% of suitable homes cost-effective** for limited PFR within 20 years.
- **Challenges:** rental dominance in North Kensington, conservation planning limits, high rebuild costs.



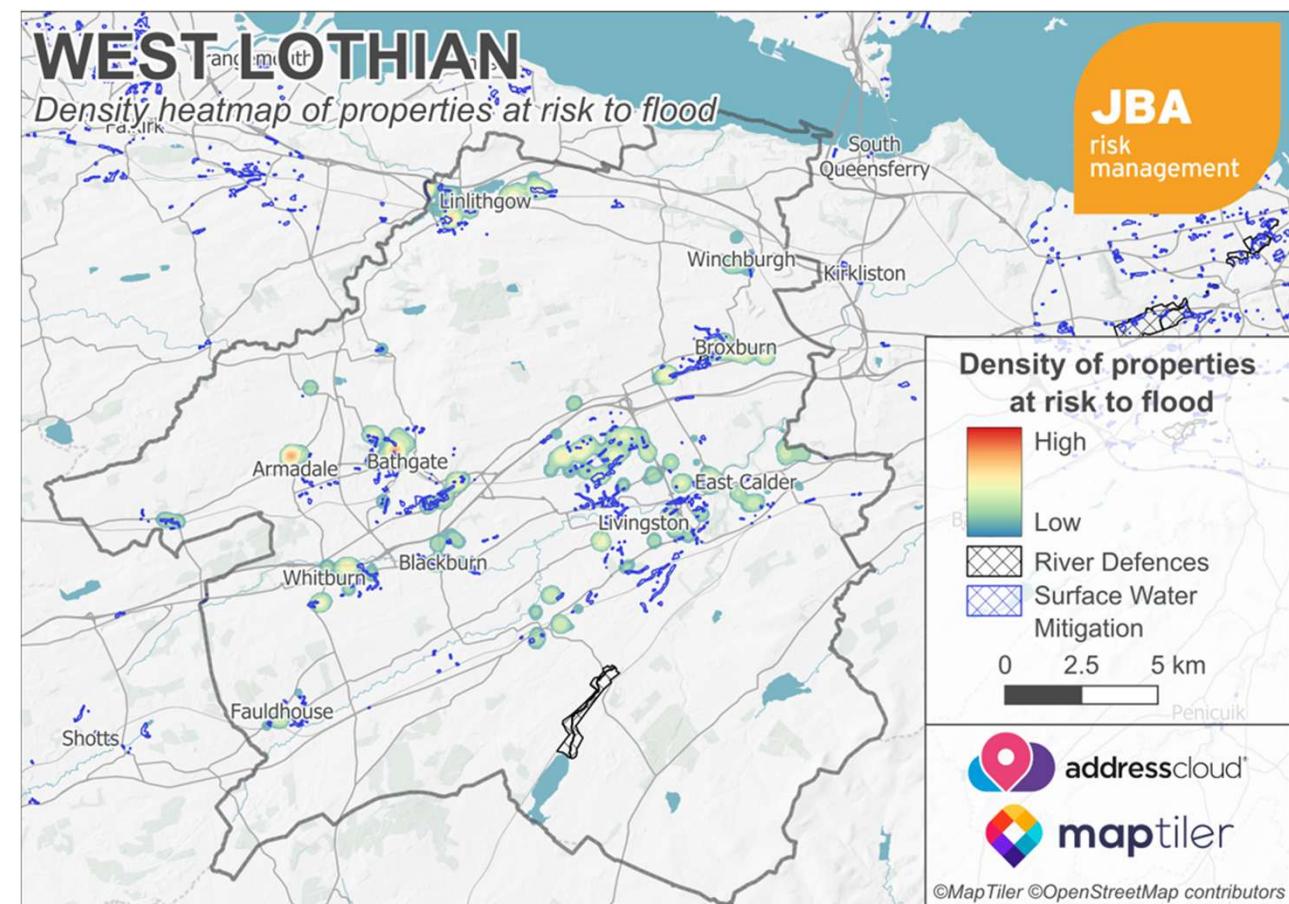
HULL

- **Multi-peril flood risk** (river, tidal, surface water); major event in 2007.
- **84% of homes suitable for PFR**, mainly terraced/semi-detached houses.
- **66,500+ homes at risk**, with AAL of **£34.4m/year**.
- PFR could reduce losses by **£19.5m/year (57%)**.
- **38% of homes cost-effective** within 20 years; 11% within 5 years.
- 44% of at-risk homes outside formal defences; high deprivation and rental tenure pose barriers.



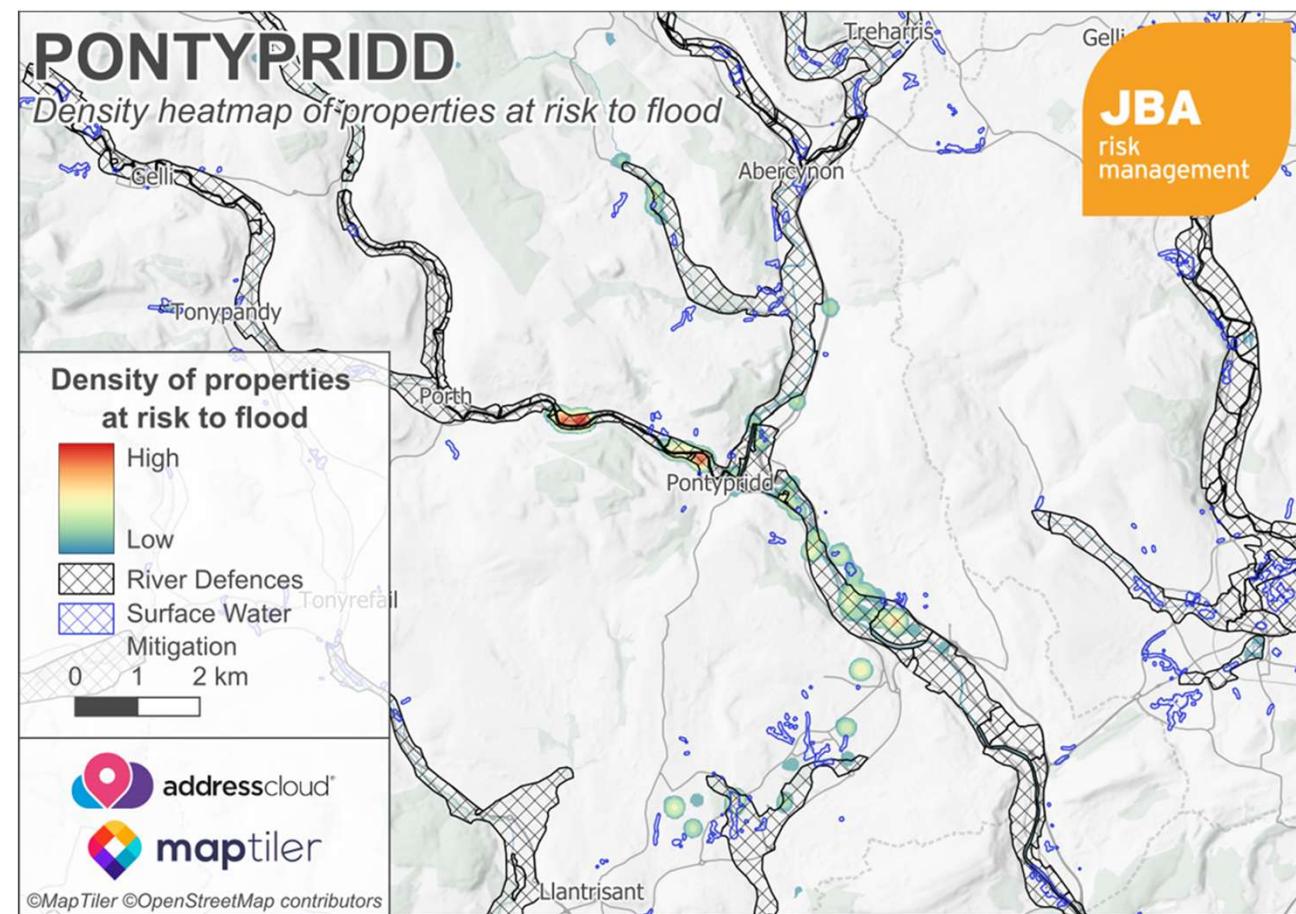
WEST LOTHIAN

- **Flooding from rivers and surface water**, especially in Broxburn, Linlithgow, Bathgate.
- **50% of properties suitable for PFR**, mainly terraced/semi-detached houses.
- **About 2,500 homes at risk**, mostly outside defences.
- PFR could cut losses by **£430k/year (28%)**.
- Only **33% of suitable homes cost-effective** within 20 years.
- Small, dispersed flood clusters make PFR more viable than major



PONTYPRIDD

- **High fluvial and surface water risk**, exemplified by Storm Dennis (2020).
- **88% of properties suitable for PFR**, especially terraced/semi-detached homes.
- Over **2,150 homes at risk**, with 90% suitable for PFR.
- Potential **45% AAL reduction (£395k/year)** from PFR.
- **34% of homes break even** on limited PFR within 20 years.
- **Challenges**: deprivation, low ownership, and high disability rates limiting uptake.





Resilience Landscape and Flood Performance Certificates

Flood Re's Commitments



Build Back
Better



Flood Performance
Certificates



Scoring
Methodology
for Property
Flood Resilience



Supporting
Natural Flood
Management
techniques



Centre of
Excellence



Improving
awareness
of flooding



Supporting
an effective
planning system



UK housing stock – expensive to repair, but can be made resilient



Types of home adaptation



Sophisticated protection
– high cost, for the high risk



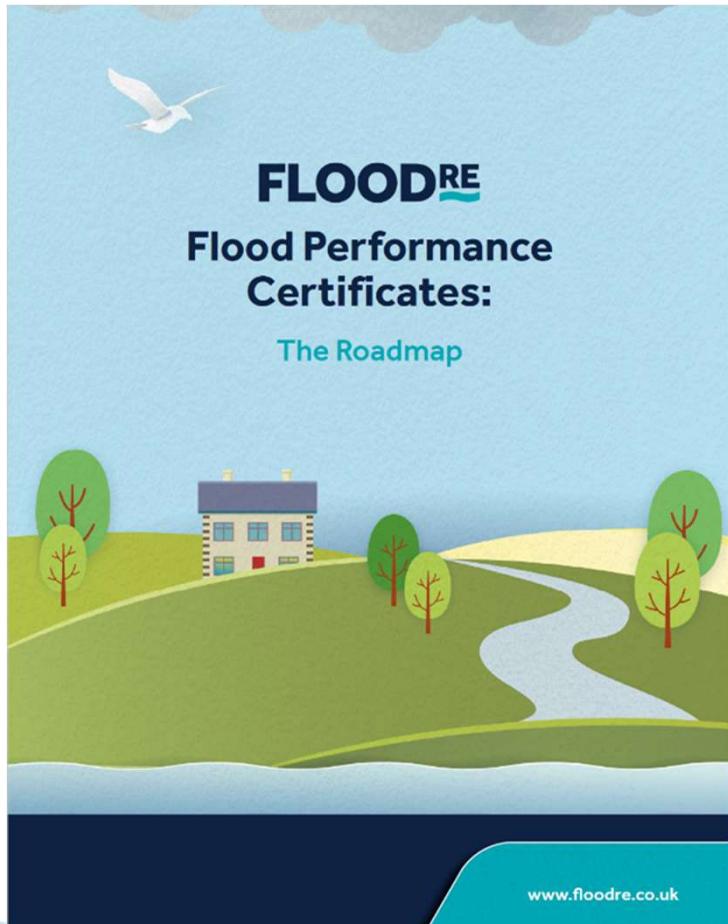
Increasing risk!



Simple measures – low cost, some protection.

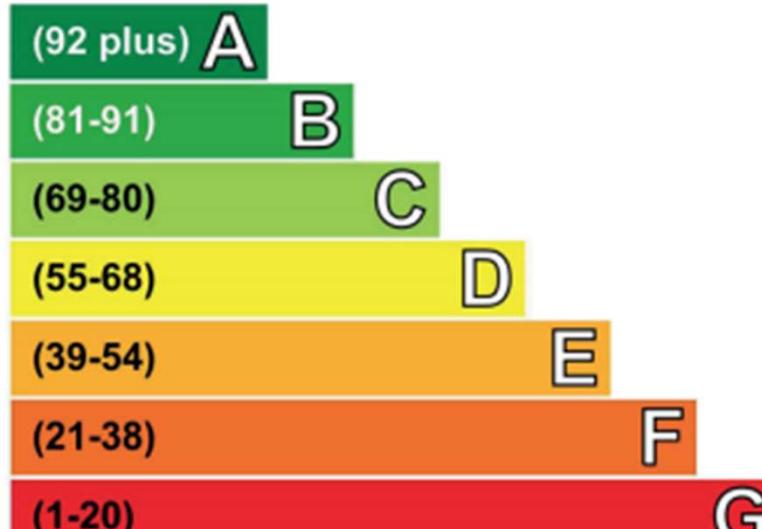
Flood Performance Certificates

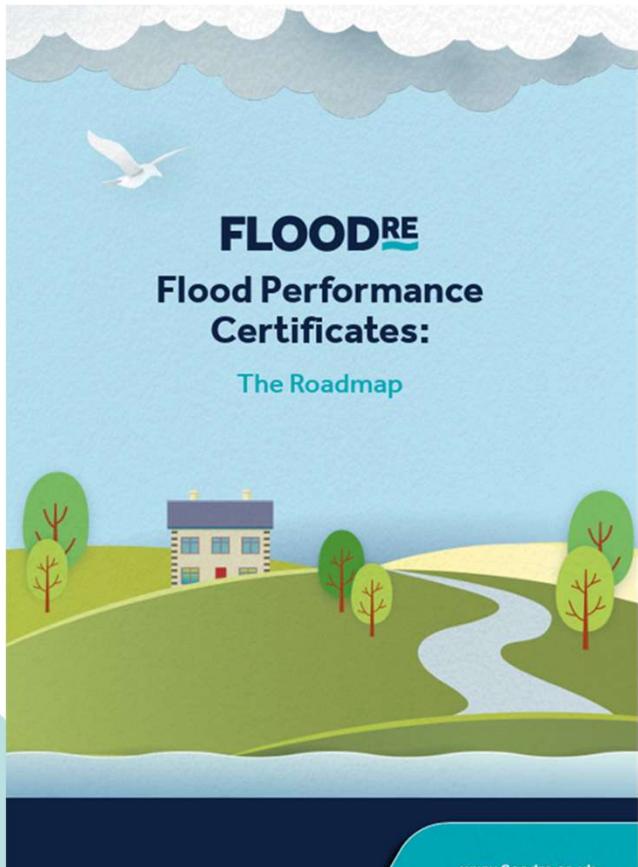
FLOODRE



Energy Efficiency Rating

Very energy efficient - lower running costs





What is the road map to creating the FPC framework?

Four stages to the creation of an FPC framework:

1

Develop a model that recognises the different ways flood damage can be reduced at household level

Flood Re is working with the Flood Hazard Research Centre at Middlesex University to develop a scoring system for Property Flood Resilience. The first phase of this work, based on a pilot area in Kent, is complete.

The model utilises an existing methodology for linking flood depths and damage, but is being updated to include all the ways in which PFR can reduce damage and distress (for example recognising the benefits of adaptations which mean that a home is habitable after a flood). The final model will be able to combine intrinsic features of the home, adaptations that keep out water and steps to reduce damages.

2

Make it practical by standardising the method of assessing individual homes

For a framework to be able to assess the resilience of individual homes, the assessments of each home needs to be done in a consistent way.

Assessing individual properties for flood resilience is not new - this already happens for homes getting adaptations, and the PFR training and Code of Practice set out how this should be done. Flood Re will work with the PFR sector to ensure that the data required to inform the FPC can be collected in a standardised way, as simply as possible.

PFR Evidence Base - Testing

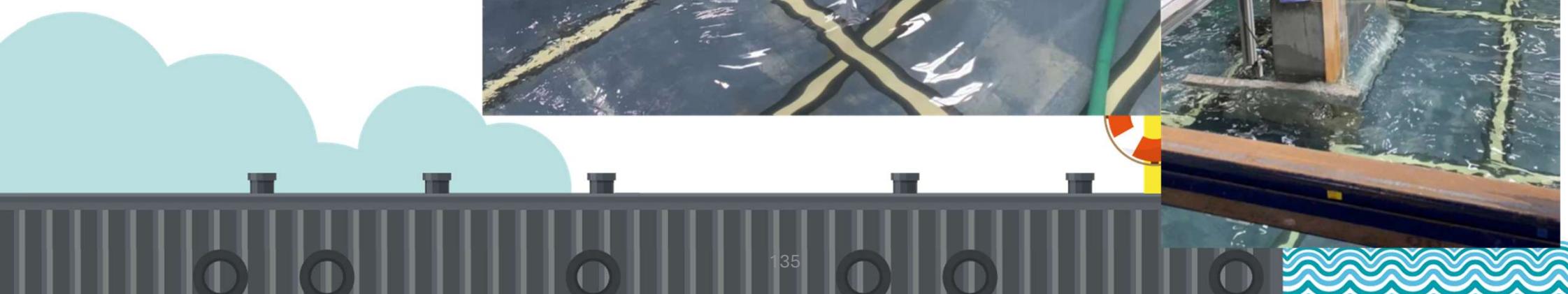
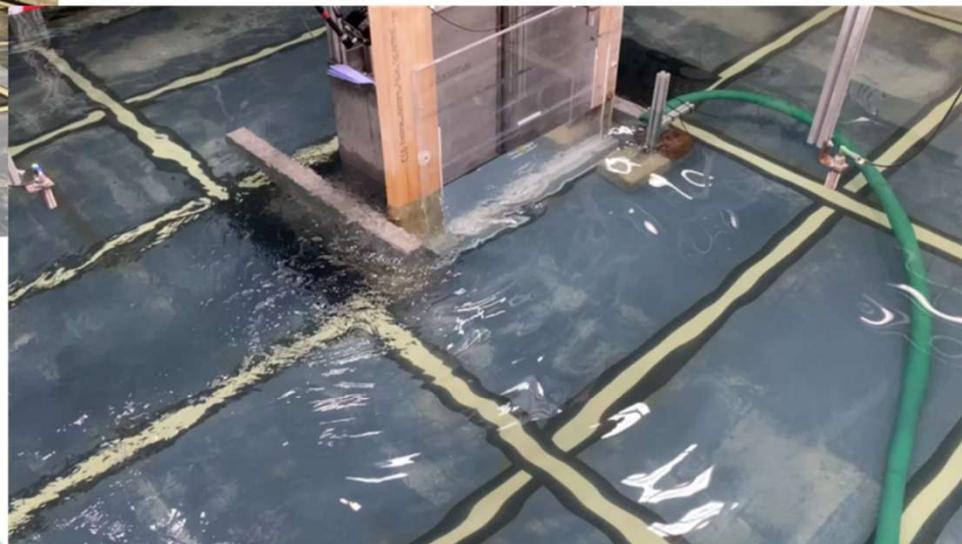
FLOODRE



UNIVERSITY
of HULL



Environment
Agency





THE PROPERTY FLOOD RESILIENCE ACTION PLAN

An action plan to enable better uptake of resilience measures for properties at high flood risk

Dr Peter Bonfield OBE FREng
Chairman
September 2016

Department for Environment, Food & Rural Affairs

Publication - Consultation paper

Building standards guidance - Section 3.3 Flooding and Groundwater: consultation on proposed updates

Published: 11 July 2025
From: [Cabinet Secretary for Housing](#)
Directorate: [Local Government and Housing Directorate](#)

Consultation to consider updates to the guidance within Section 3.3 Flooding and groundwater of the Technical Handbooks with a particular focus on



PFR works!

FLOODRE



From Risk to Resilience: A model for delivering Property Flood Resilience (PFR) in Scotland

Emily Christopherson-Smith, JBA Consulting

Shona Collins, West Lothian Council



From Risk to Resilience: A model for delivering Property Flood Resilience (PFR) in Scotland

Emily Christopherson-Smith (JBA Consulting)

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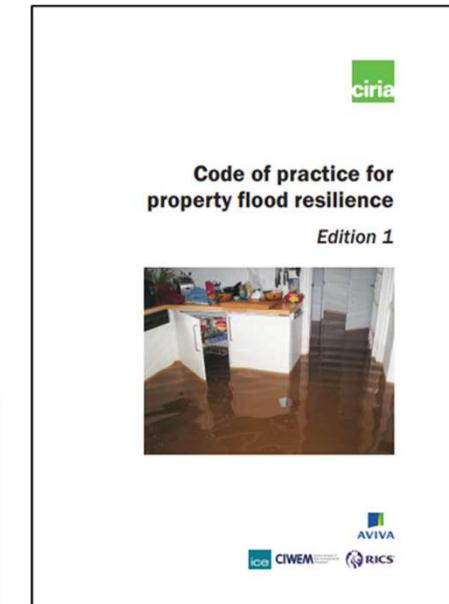
27th January 2026



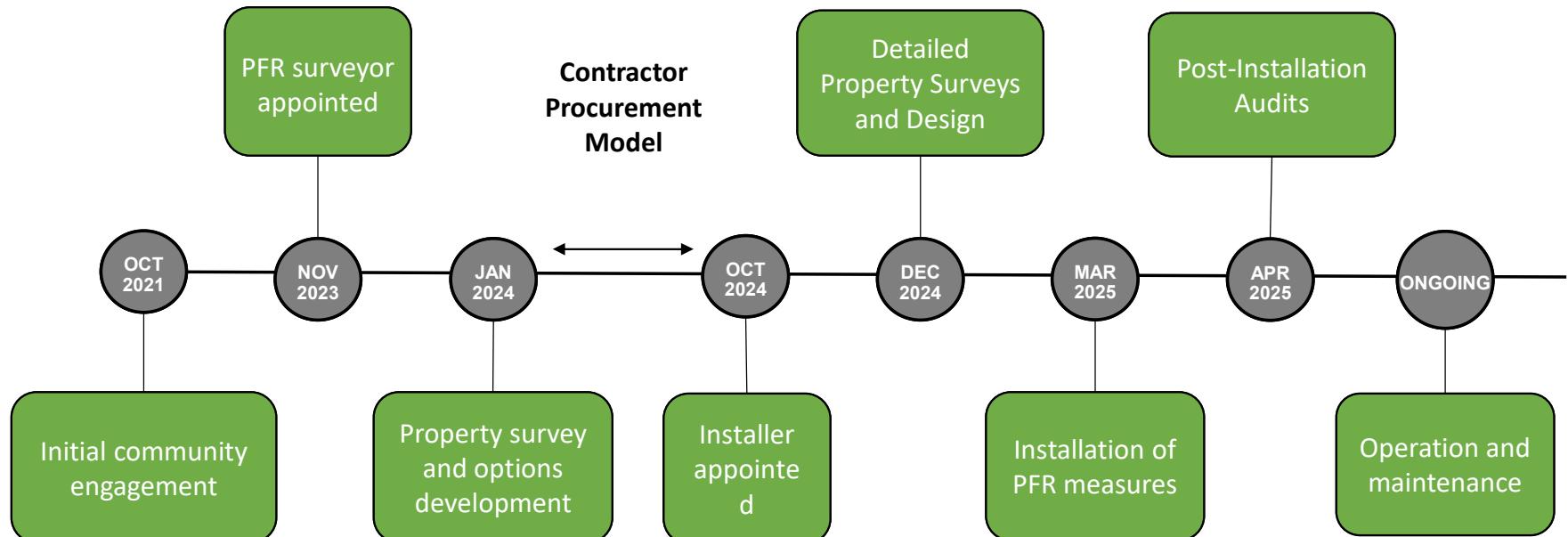
Background

Aims:

- 1) Deliver a fully-funded comprehensive PFR scheme adhering to best practice guidance.
- 2) Ensure handover and maintenance was incorporated for longevity.
- 3) Improve flood preparedness, awareness and resilience in the community.

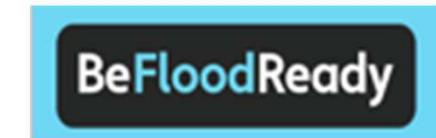
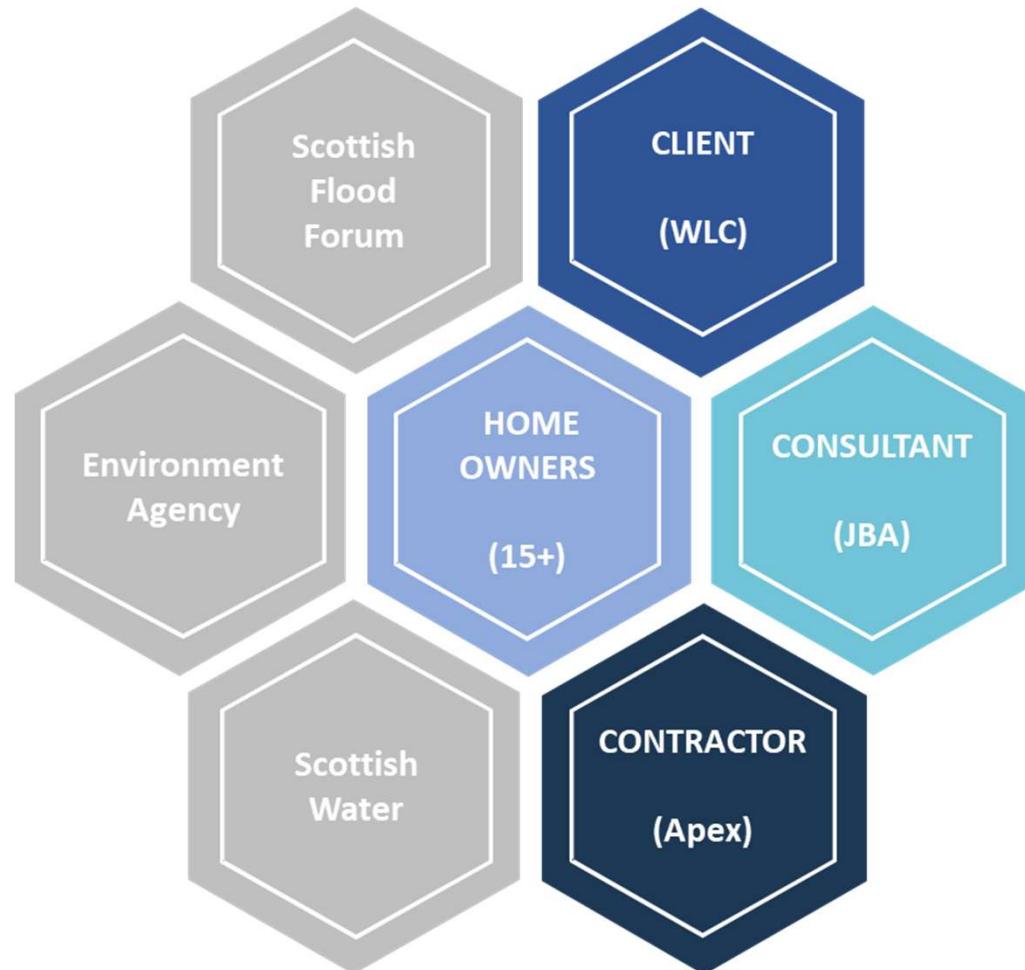


The scheme process



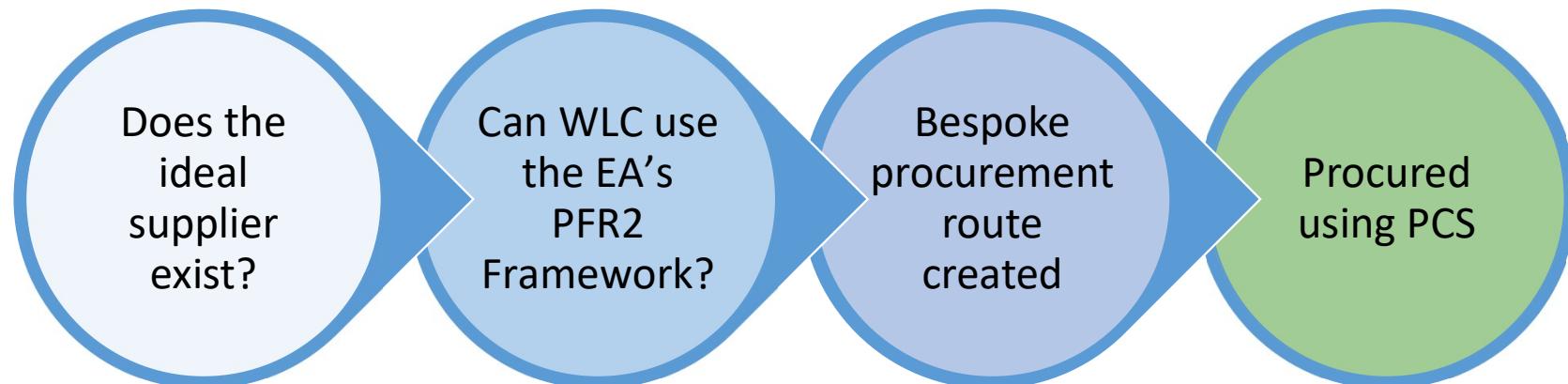
**West Lothian
Council**

Engagement and collaboration



West Lothian
Council

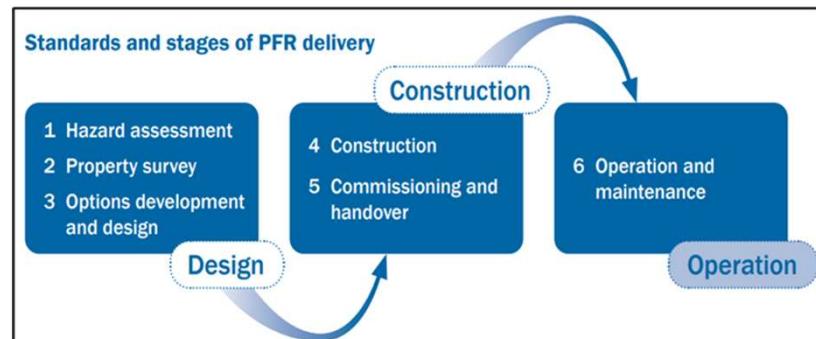
Contractor Procurement Model



West Lothian
Council

Successes

- Delivered a fully-funded comprehensive PFR scheme adhering to best practice guidance.
- Full uptake achieved.
- Kitemarked products installed (where available) as per the EA's MTR.
- Improved flood preparedness, awareness and resilience in the community & BeFloodReady partner.
- Handover and maintenance was incorporated for longevity.
- Cost-effective 'standard' flood resilience delivered: £11,000 - £15,000 per property.



Thank You

“You've been great! Thank you for all the information, appreciate it. That's a good service you provide, keep up the good work!”

“Great work, excellent. Apex kept me informed of what they were doing, really good.”

“All work carried out was excellent and to the highest standard, as well as being tidy.”

For more information please contact:

pfr@jbaconsulting.com

floodriskmanager@westlothian.gov.uk



West Lothian
Council



Competence and confidence in Property Flood Resilience

Paul Shaffer
CIWEM





Competence and confidence in Property Flood Resilience

Paul Shaffer, CIWEM and BeFloodReady

BeFloodReady
CIWEM's Community of Practice

CIWEM

Aspirations for PFR

- **Certainty and clarity** – a consistent approach, clear requirements, roles/responsibilities (Code of Practice for PFR) underpinned by good data.
- **Competency** – training aligned with the Code of Practice, independently assessed professional register providing assurance to clients.
- **Confidence** – trusted information and trusted delivery – good flood warnings and guidance with verified competency of professionals.
- **Consistency** – standard process and quality assurance to ensure high-quality delivery making resilience outcomes repeatable.
- **Community and collaboration** – a coordinated sector aligned to delivering PFR and sharing learning.



↳ Certainty & clarity

Code of Practice for PFR

- **WHAT** - benchmarks for good practice (6 Standards).
- **HOW**
 - Guidance on the process (6 Stages).
 - Key principles
 - Competency – appropriate person
 - Communication
 - Proportionate approach
- **WHERE** – Code of Practice underpins approaches being undertaken by EA, local government and insurers



Competency – Through learning



- Seven courses and 70 hours of learning.
- Foundation course provides an overview and a requirement for any of the technical courses.
- Self paced elearning and instructor lead advice surgeries and facilitation.
- The seven courses are a requirement for the CIWEM specialist register for PFR professionals.
- Aimed at a variety of professionals.
- For the future considering:
 - Developing proportionate courses for builders
 - Focusing on intelligent/informed client role

Competency - the learning journey



↳ Confidence & consistency

CIWEM's Specialist Register for PFR Professionals

- A register providing reassurance on competence.
- Certified against individual CoP standards.
 - Surveyor (and quality assurance)
 - Contractor/installation
- Assessment based on:
 - Successful completion of accredited training
 - CV
 - Report on case studies demonstrating competencies.
 - Successful Professional Review Interview



Community & collaboration

BeFloodReady – Community of Practice for PFR

- Supporting the community, providing consolidation confidence and consistency.
- Hosting and signposting relevant resources related to PFR delivery.
 - Searchable resources (guidance, reports etc) 150+
 - Searchable case studies 14
- Host events to share good practice.
- Link to accredited training and events.
- Find professionals on the Specialist Register.
- Share industry news (blog & newsletter).

The screenshot shows the BeFloodReady website homepage. The header includes the logo 'BeFloodReady CIWEM's Community of Practice' and a navigation bar with links for News, Events & training, PFR training, Specialist Register for Property Flood Resilience, About, Property Flood Resilience, Partners & supporters directory, Case studies, Resources, and Contact us.

The main content area features a large image of floodwater. Overlaid text reads 'Community of practice on property flood resilience (PFR)' with a 'Sign up for free' button. Below this, a section titled 'How can the community of practice help?' contains three cards: 'Property flood resilience' (describing measures to reduce flood risk), 'Before a flood' (describing preparedness), and 'Following a flood' (describing recovery).

A central diagram titled 'What is PFR?' shows a circle divided into four quadrants: 'Flood resistance' (top left), 'Flood preparedness' (bottom left), 'Flood recoverability' (bottom right), and 'Flood resilience' (top right). Arrows connect these quadrants to a central text box that defines PFR as an approach to managing flood risk.

For the future – getting involved

- **Signup** to the Community of Practice.
- Follow us on LinkedIn
- Opportunities to contribute content for:
 - Case studies
 - News items/blogs
 - Contribute to the BeFloodReady LinkedIn Group
- Further collaboration with CILA, FMB, RICS and others.
- Become a Partner or Supporter for 2026-2028
- For further information contact:

paul.shaffer@ciwem.org

BeFloodReady
CIWEM's Community of Practice



Scan me 

BeFloodReady
CIWEM's Community of Practice

CIWEM



Plenary Discussion Q&A



venture



Scan the QR code with your phone or tablet camera

OR

Log into a web browser and enter – www.slido.com and enter Floodresilience2026 in the box with 'enter code here'

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Scotland's Flood Resilience Conference 2026

Parallel Session B – Public Service Reform

Hannah Swanson, Scottish Government



“We will require all public services to consider how they work through a place frame, and change their actions accordingly.

We will also empower those who work in public services to bring forward opportunities which can improve services. We recognise that those on the front line are best placed to identify improvements to services.”



Scotland's Public Service Reform Strategy – Delivering for Scotland (2025)

Public Service Reform: Working to enable place-based delivery

In the service
of Scotland



Scottish Government
Riaghaltas na h-Alba

PSR through an environmental service delivery lens

		
Pillar 1 Prevention	Pillar 2 Joined up services	Pillar 3 Efficient Services
W5 Understanding and mitigating demand drivers	W7 Simplification	W11 Data collection
W6 Preventative budgeting	W8 Data sharing and data usage	W12 Workforce
W9 Local integration: strengthening Community Planning and realising the potential of the third sector.		
W10 Digital Public Services		
		
Foundations		
W1 Leadership and cultural change	W2 Accountability and incentives	W3 Empowering people, places and communities
		W4 Ensuring the right delivery landscape

The Pioneer Catchments: Using a place-based approach to deliver PSR.

- The 'River Dee' and 'South Esk & Angus Glens'.
- Trial changes to service delivery based on PSR objectives & *climate resilience*
- Demonstrate the impact on
 - ❖ the landscape
 - ❖ service users
 - ❖ the environment family and our performance

Place

We must strengthen local, joint decision making and sharing of power & resources

People, communities & third sector need to be systematically involved in service design

Delivery landscape should be simple and effective

Turning theory into practice

What we'd like to do

- Add value.
- Meaningful participation.
- Resolve conflicts.
- Simplify public agency / government intervention.
- Turn trade-offs into win-wins.
- Face the other blockers head on.

What we need to know

- What wastes your time?
- What, in your opinion, leads to waste of money?
- What makes it difficult to do the right thing?
- What gets in the way of delivering landscape-scale climate resilience?

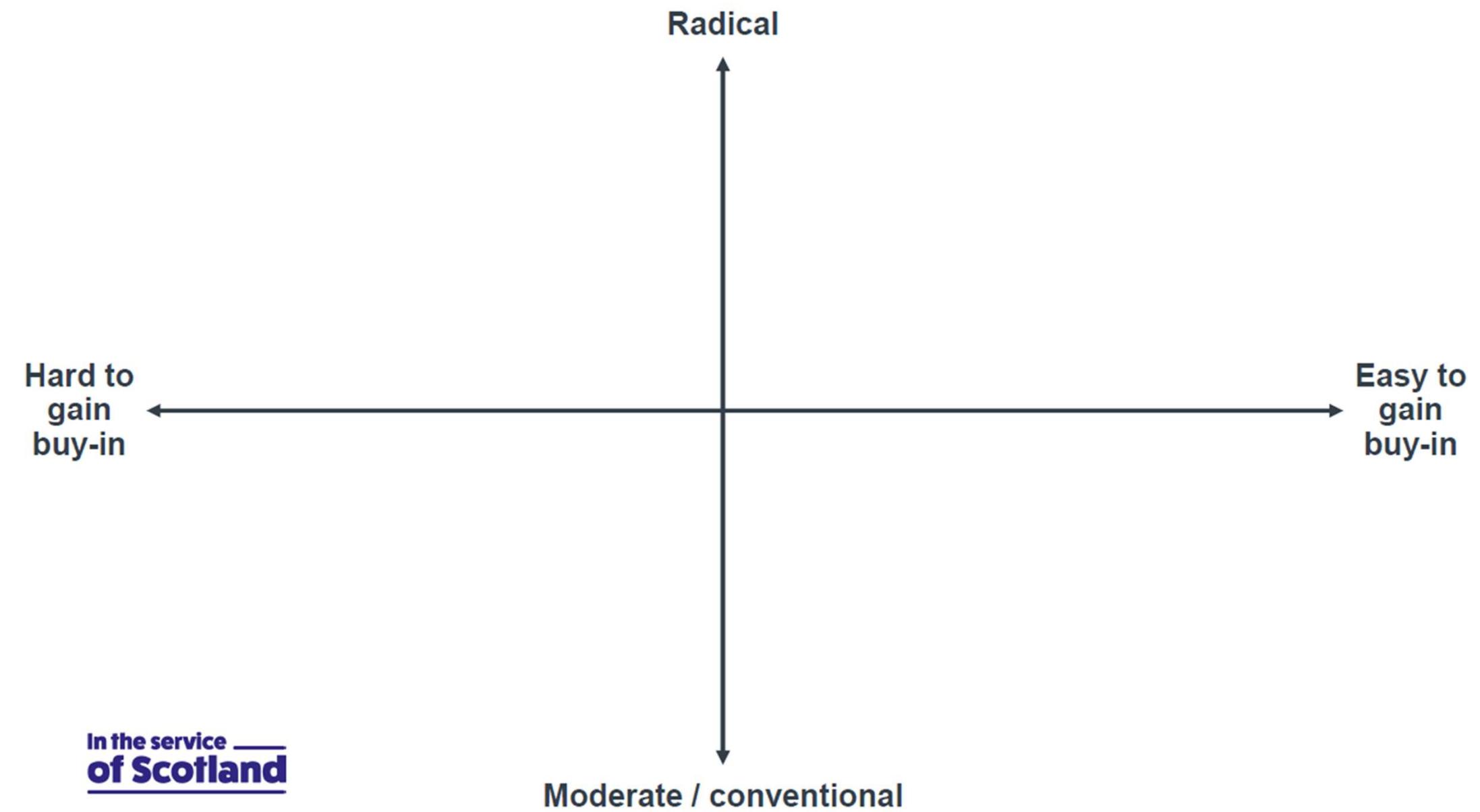
**Rant
incoming...**

Group Activity

What **tangible** ideas do you have which would significantly **improve** the delivery landscape?

Delivery landscape: The process from start to finish of delivering environmental interventions (e.g., nature-based solutions).

Map your ideas on the flipchart provided.





This isn't the
end of the
conversation.

**In the service
of Scotland**

**For the Environment Futures
Programme, contact:**

Hannah Swanson
Project & Engagement Manager
Future Environment Division
Environment & Forestry
Scottish Government

Hannah.Swanson@gov.scot

**For the South Esk & Angus
Glens, contact:**

David Harley
Senior Lead, Environmental
Resilience
Scottish Environment Protection
Agency

David.Harley@sepa.org.uk

With many thanks to:

Nick Wilding
Head of Organisational
Development
Agriculture & Rural Economy
Scottish Government

Nick.Wilding@gov.scot

**For the River Dee catchment,
contact:**

Rachel Helliwell
Catchment Project Officer
Cairngorms National Park
Authority

RachelHelliwell@cairngorms.co.uk



Scotland's Flood Resilience Conference 2026

Parallel Session C – Nature-based Solutions

Eather Carmen, James Hutton Institute



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Scotland's Flood Resilience Conference 2026

Parallel Session D – Land-se Decision Making

Kat Fradera, University of Glasgow

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Movement break

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Scotland's Flood Resilience Conference 2026

Plenary Session – Place (Land-use)

Chair: Susan Veitch, The Highland Council

Resilience and Biodiversity in the Peffery Catchment

Richard Lockett

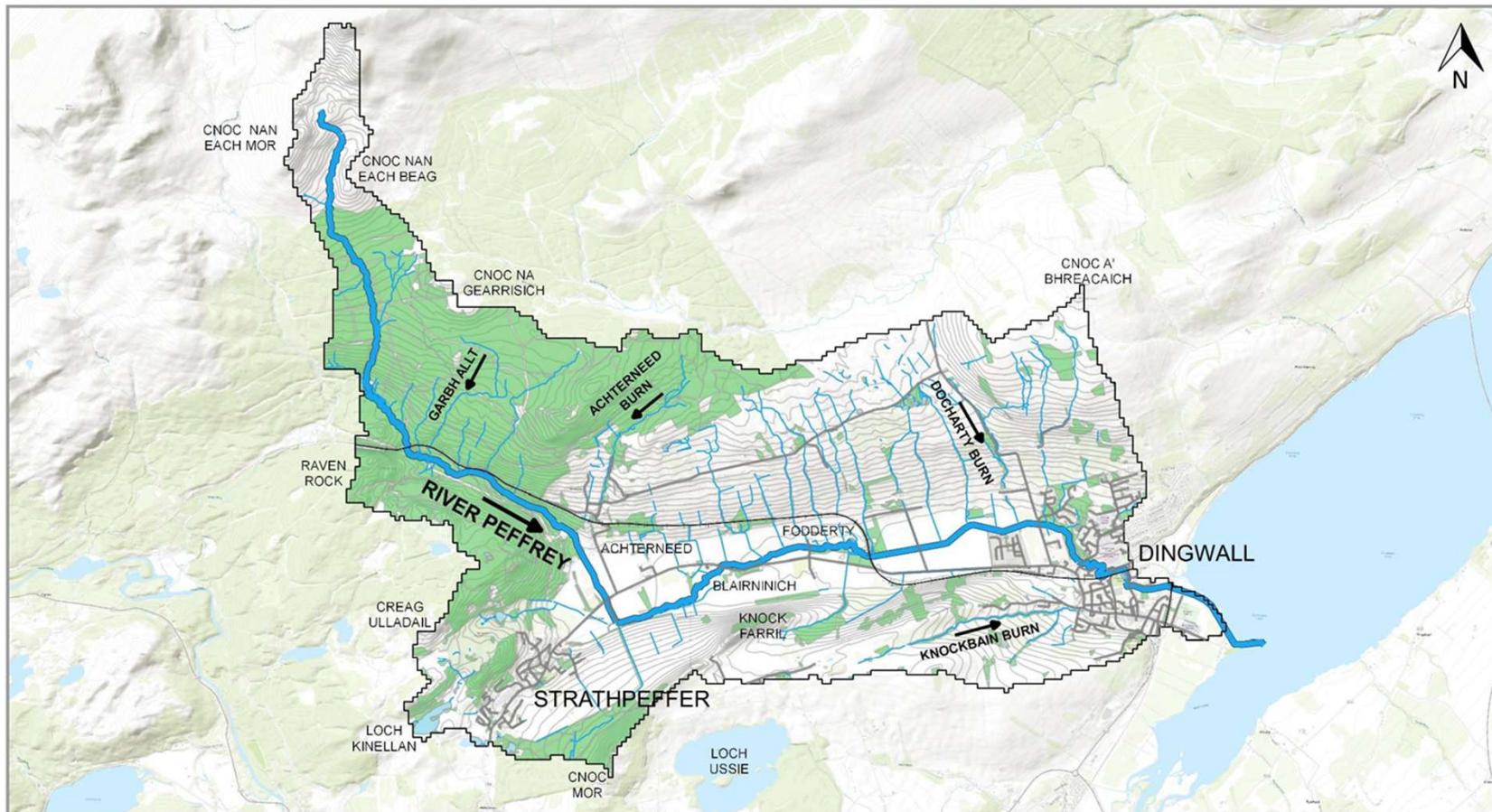
Lockett Agri-Environmental

Resilience and biodiversity in the Peffery catchment



Richard Lockett (Lockett Agri-Environmental)

RIVER PEFFREY CATCHMENT - LOCATION



- River Peffrey*
- Tributaries/ Field Drains*
- Water Bodies*
- Catchment Boundary
- 10 m Contours*

- Woodland/ Forestry*
- Railway Line*
- Roads*

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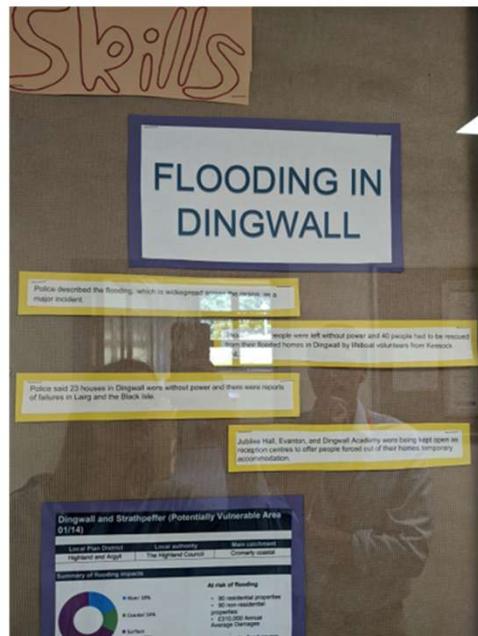
HIGHLANDS
CLIENT
PROJECT

AGRI - ENVIRONMENTAL
PEFFERY CATCHMENT
STUDY

0 1 2 3 km

Project no. 2150344
Date 24 JAN 2023
Drawn —
Designed —
Reviewed —

Scale @ A4 - 1:60,000
British National Grid
GCS OSGB 1936



Ross-shire Journal

Friday, July 12, 2019 | Established 1875

www.ross-shirejournal.co.uk

£1.35 SUBSCRIPTION PRICE: FROM 75P



Campervan mess sparks anger

Page 3

Your guide to the best entertainment

Seven Days - Free inside



Answers wanted after torrential rain leaves town counting the cost... again



Burn Place shortly after the flooding.

Flash floods cause chaos

By Scott Maclellan
s.maclellan@ppg-group.com

DEVASTATED residents have demanded answers after flash flooding sent a torrent of water through parts of Dingwall and several other Ross-shire towns.

More than a month's worth of rain fell in the space of hours on Wednesday night, sparking dramatic scenes in the Ross-shire capital as roads turned into rivers. Even before the clear-up had finished, residents were demanding answers, with many people saying they were promised this would 'never happen again' following similar flooding in 2006, amid allegations that an early warning system had failed or gone unanswered.

Questions have also been raised over the state of the town's drains, with residents saying they had raised concerns that some were clogged in the weeks before the flooding.

The downpour started around 5.30pm and within 30 to 40 minutes calls were being made to the emergency services.



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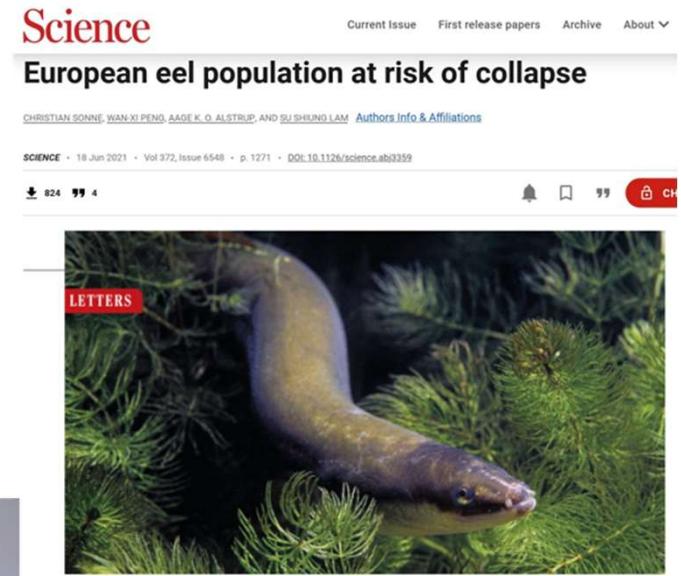


Tommy Hansen Proprietor
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109 High Street, Invergordon, Highland IV18 0AB
E mail : Tommy.hansen@sky.com

LAE
LOCKETT AGRI-ENVIRONMENTAL



Edited by Jennifer Sills

European eel population at risk of collapse

The European eel (*Anguilla anguilla*) population has declined by 98% since 1980 (1). The trade of European eels requires permits from the Convention on International Trade in Endangered Species (CITES) (2). Although these eels are active in Baltic waters from October to November (2), Denmark, which harvests 180 tons of commercial eels in 2020 alone, has no restrictions on nor inventory of recreational fishing (3). In 2019, the total EU harvest of commercial adult and juvenile eels was more than 2000 tons and 35 tons, respectively, and another 1625 tons were lost to hydropower plants and their reservoirs (4).

9. The European Society for Eel Migration Report provides detailed analysis and highlights (2020). [www.fishbase.org/2020-05/Eel-migration-report.pdf](http://fishbase.org/2020-05/Eel-migration-report.pdf)

10. C. Sonne, W.-X. Peng, A. K. O. Alstrøup, S. Shuiling Lam, "European eel (Anguilla anguilla) migration 98 percent of 5.51, they continue to be fished," *Danmarks Naturfondingshjemmning* (2021). www.dn.dk/myselol/anguilla-anguilla-tilfugtning-til-angrebsfiskeriet-og-tilfugtning-til-genforening-til-selv-de-stedig-fisker/ (in Danish).

11. ICES, "European eel (Anguilla anguilla) throughout the North East Atlantic," *ICES Journal of Marine Science* (2016). [www.icesjms.oxfordjournals.org/2016/2020/ices-2737.pdf](http://icesjms.oxfordjournals.org/2016/2020/ices-2737.pdf)

12. UN Department of Economic and Social Affairs,

'Ludicrous' situation as Dingwall Business Park development hampered by flood protection fears

By Scott MacLennan - scott.maclennan@hnmedia.co.uk

Published: 10:00, 30 January 2022



Peffery project is a true trailblazer

By Scott MacLennan
www.thesunnewspapers.co.uk

THE River Peffery has been rerouted in a major effort to restore natural habitats where nature can thrive while at the same time helping to reduce the risk of flooding in Dingwall.

Locally-based Lockett Agri-Environmental consultants started planning for the project from March 2021 with staff beginning work on-site near the railway bridge in July.

The area where the work was completed saw land donated by Viscount Gough of Keppoch and Inchavannie Estate worked on so that channels straightened back in the 19th century could be re-meandered.

That creates a new area of river corridor and floodplain, offering rich habitats where nature can thrive.

By reconnecting the river to its floodplain, the project also hopes to reduce downstream flooding in



The project team involved in the 're-meandering' of the Peffery believe the scheme will provide a boost to natural habitats and could also reduce the risk of flooding in Ross-shire's county town.

Dingwall. It means the water has more space to flood into the wetlands and backwaters associated with the re-meandered river, reducing the downstream peak flooding effect associated with simplified or straightened river systems.

Richard Lockett said that by converting an area of grassland to wetland whilst maintaining maximum tree cover, the project has the potential to sequester a significant amount of carbon.

He said: "The spark for the

project came from scoping work that Highland Council carried out in 2017. "This work identified opportunities to restore the River Peffery and reduce downstream flood risk to Dingwall.

"We approached the landowner with the idea for the project and he was very positive. The more we looked into the idea the more we could see the many benefits it would provide, not just in reducing flood risk but enhancing habitat for

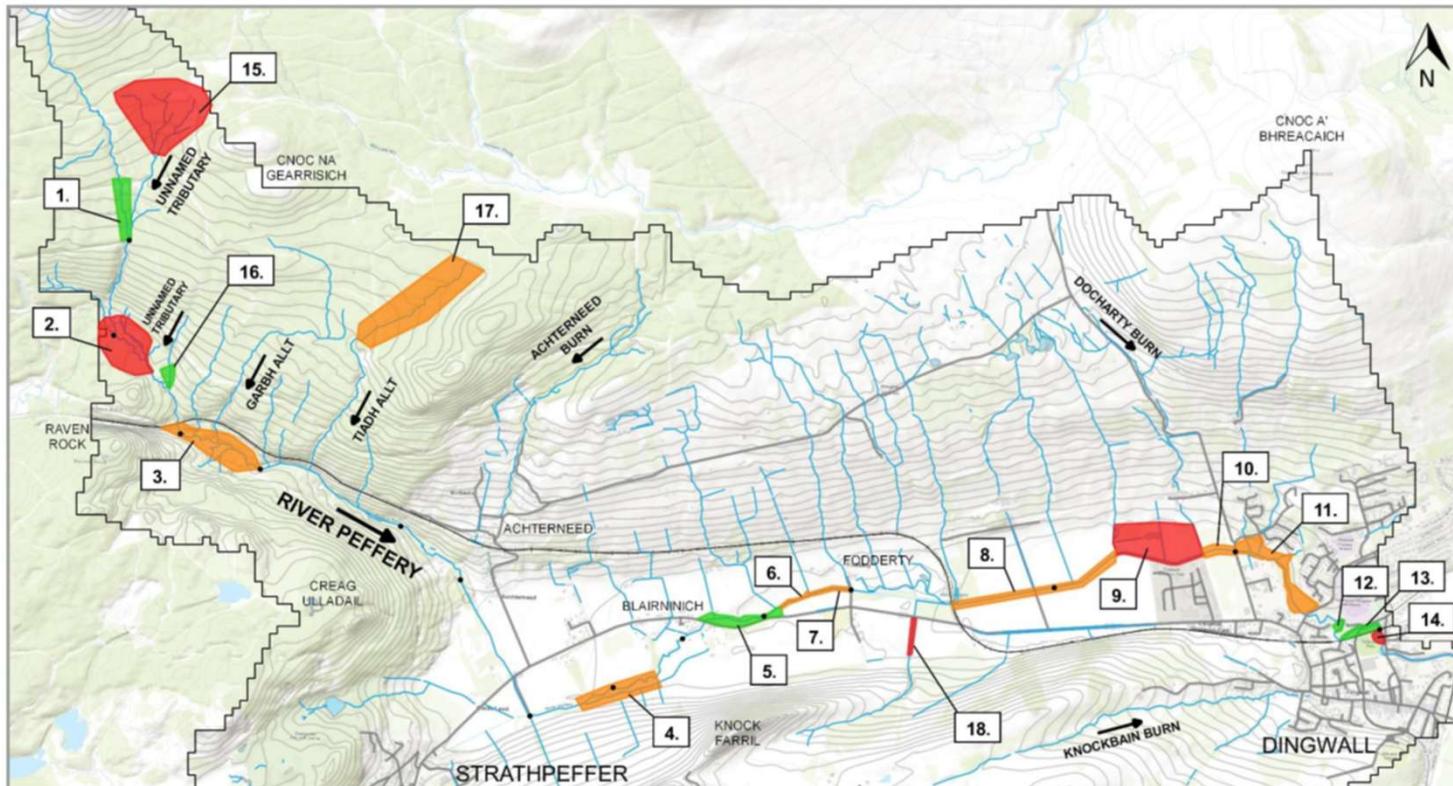
TURN TO PAGE 2

"The more we looked into the idea the more we could see the many benefits it would provide... reducing flood risk... enhancing habitat.

Richard Lockett



RIVER PEFFERY - OPTION AREAS IDENTIFIED



Option Areas

- High Priority
- Medium Priority
- Low Priority

Other Catchment Features

- Catchment Boundary

- Watercourses*
- River Peffery Reach Extents (SEPA, 2021)
- Water Bodies*
- Railway Line*
- Roads*

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CLIENT
PROJECT

AGRI - ENVIRONMENTAL
PEFFERY CATCHMENT
STUDY

Project no. 2150344
Date 16 FEB 2023
Drawn GP
Surveyed LM & GP
Reviewed KC

Scale @ A4 - 1:35,000
British National Grid
GCS OSGB 1936



NATURE RESTORATION FUND



Net Zero
Scotland
Scottish
Government

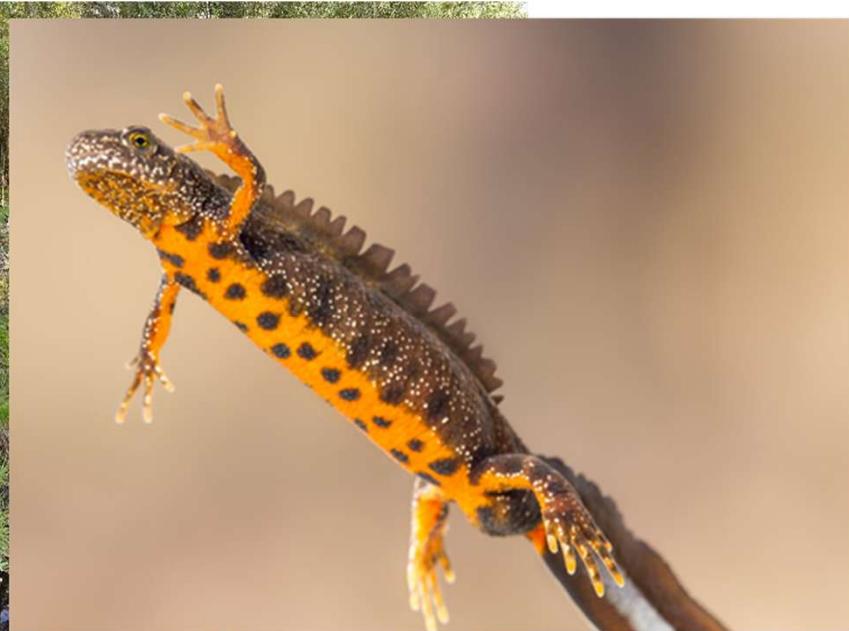


£1.2m boost will change fortunes of iconic rive



LAE
LOCKETT AGRI-ENVIRONMENTAL















Nuisance flooding vs Major Floods

Quicker, easier and cheaper

Enough people?





Flood Resilience in Placemaking

John Wright, Mott Macdonald

Iain Lyon, City of Edinburgh Council



M M
MOTT
MACDONALD
•EDINBURGH•
THE CITY OF EDINBURGH COUNCIL

FLOOD RESILIENCE IN PLACEMAKING



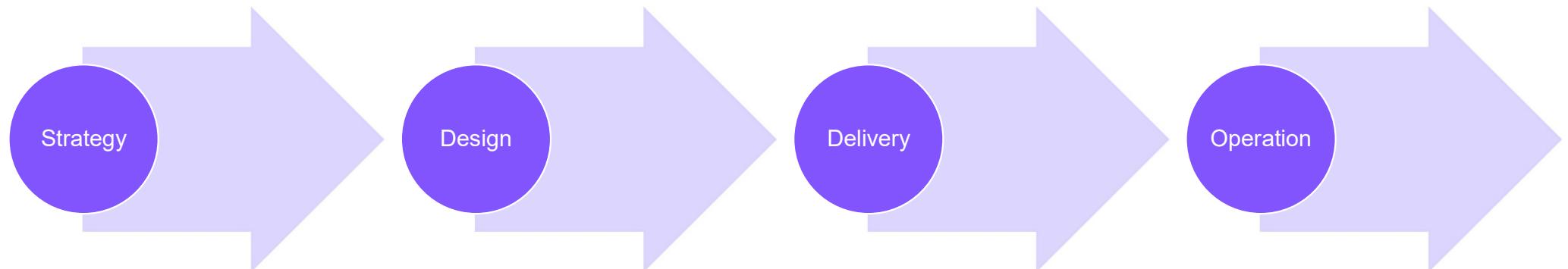
Flood Resilience in Edinburgh Through Place-Based Approaches

Strategy

“Flooding First” approach using a Strategic Flood Risk Assessment (SFRA) to inform Local Development Plan (LDP) and make space for water through land use planning.

Delivery

Embedding flood resilience in placemaking through collaborative working – sharing some lessons learned from delivery of blue-green infrastructure in Edinburgh including the Orchard Park swale.



Strategic “Flooding First” Place Based Approach

National Flood Resilience Strategy

Making space water. Supports six priority areas for outcome delivery

SEPA SFRA guidance

CEC SFRA supports development of Edinburgh LDP, City Plan 2040

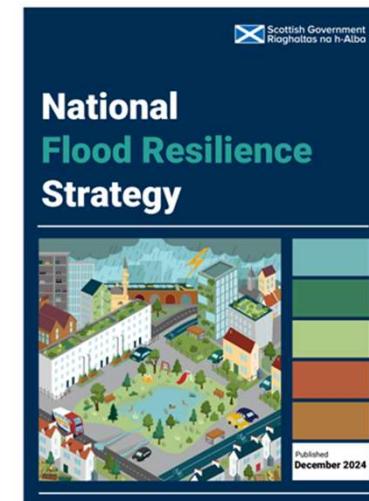
Leveraging existing data and domain knowledge

“Systems impact” focus on NPF4 Policy 22, supports other NPF4 policies

“Flooding First” to determine appropriate land parcels for development

Next stage: inform LDP Place Briefs

City-wide strategic flow path definition to support project delivery and CEC Vision for Water Management



SFRA Approach

Underpins city-wide and local community flood resilience planning.

Puts water at the heart of the land use planning process taking a whole-picture view including future impacts in a meaningful and tangible manner.

Supports sustainable development and delivery of actions to manage flood exposure, and reduction of flooding impacts when they occur.



SFRA Approach

Classifications

- No risk – the area is not identified as being at risk of flooding, from the various data sources considered
- Present day risk – the area is potentially at risk, when considering the present-day climate.
- Future risk – the area is not at risk during the present-day climate, but is estimated to become potentially at risk in a changing climate.
- Critical present-day risk – the area is potentially at risk from higher hazard flooding sources in the present-day climate and therefore the development constraints are more critical.
- Critical future risk – the area is potentially at risk from higher hazard flooding sources in the future climate and therefore the development constraints are more critical

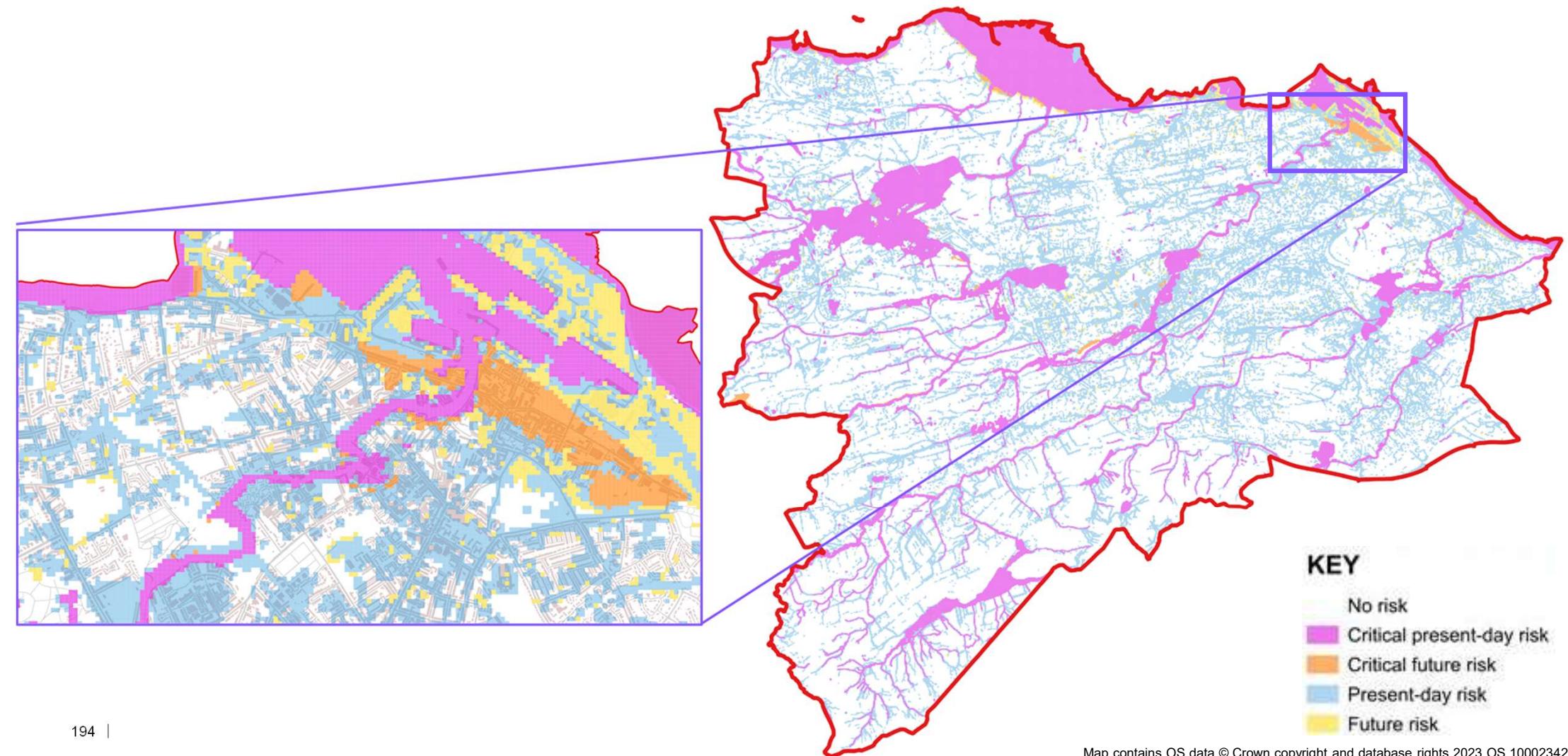
Primary and secondary flow path definition across the Local Authority area

Conservative approach to erosion, sea level rise and coastal risk in advance of emerging work

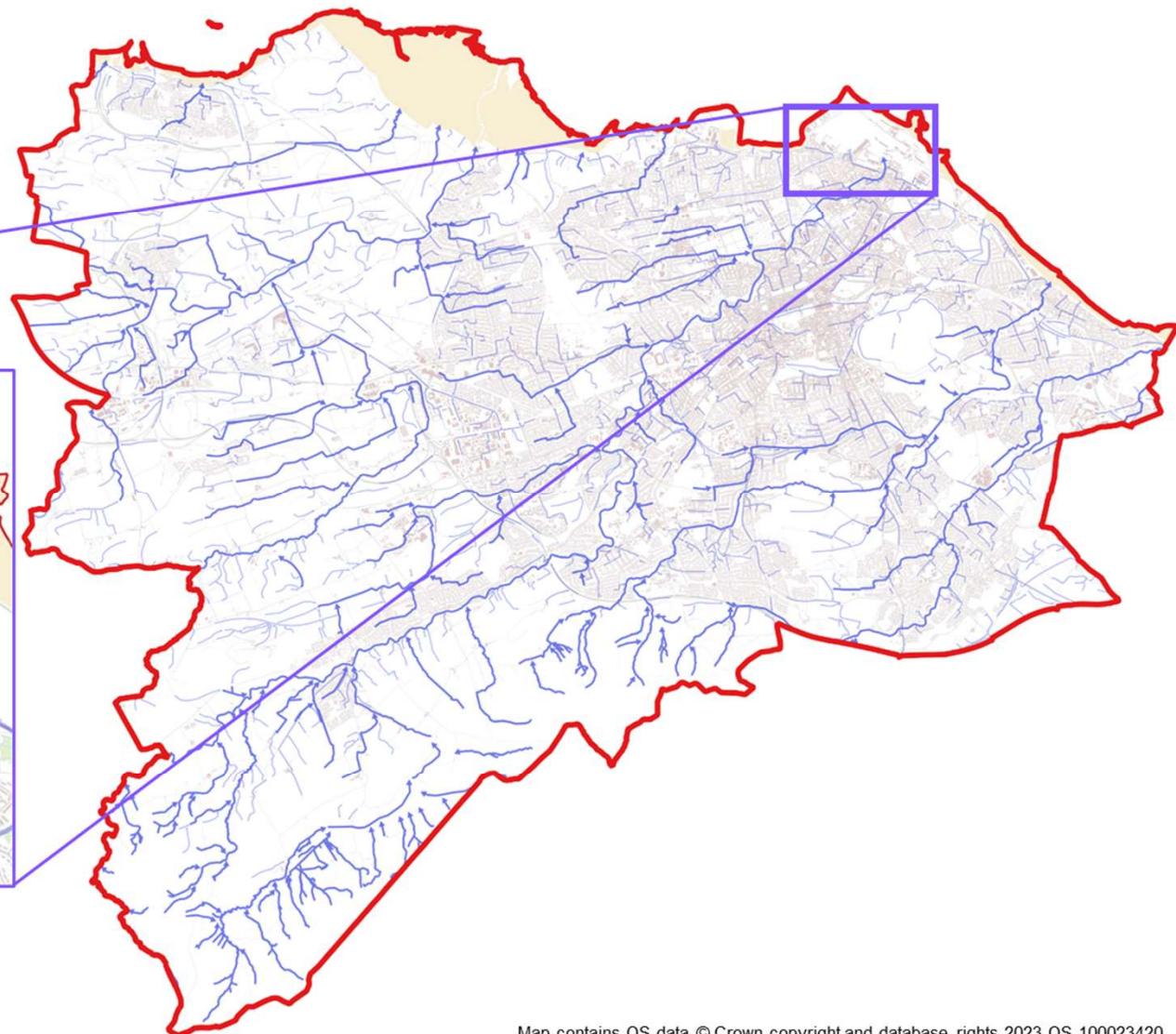
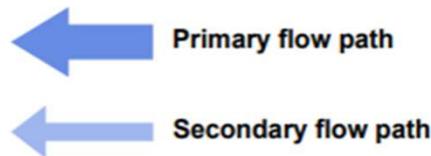
Limitations: precision site specificity, quality of data, ground water, infrastructure failure, consideration of defences (uncertainty in the standard of protection and residual risk associated with defences that have been represented).

A precautionary approach

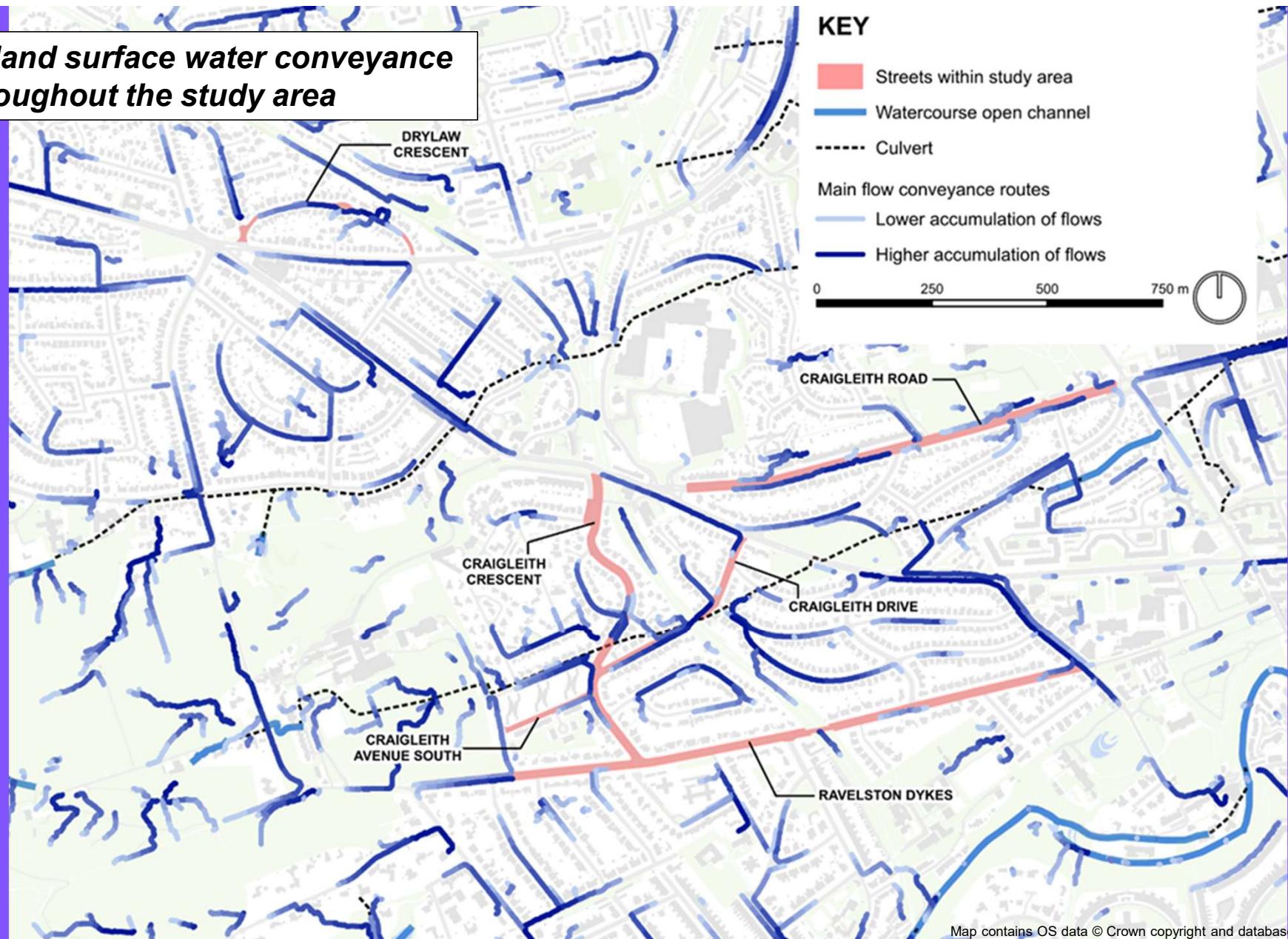
SFRA Flood Risk Assessment Outputs



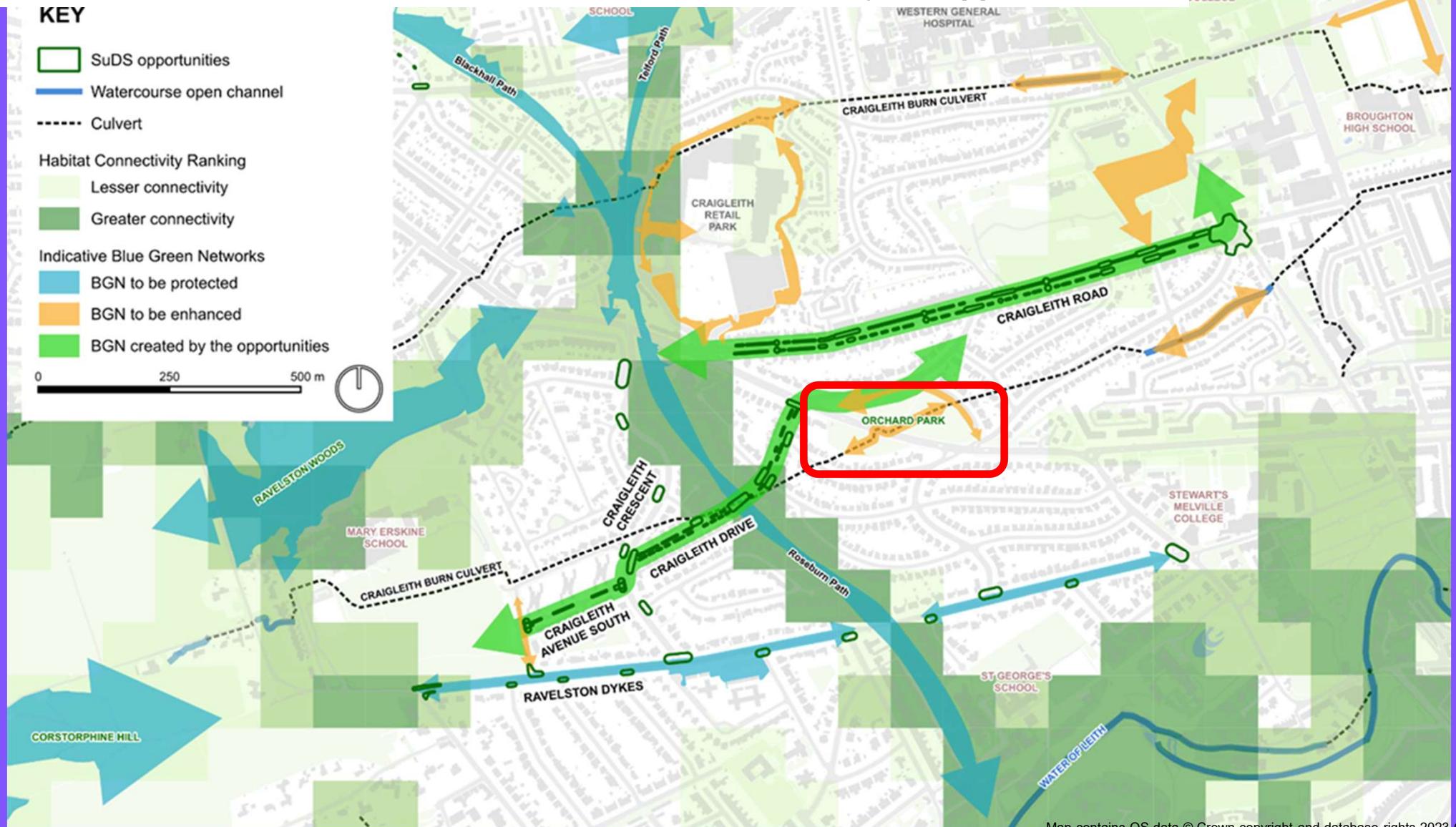
SFRA Strategic Flow Paths



Main overland surface water conveyance routes throughout the study area



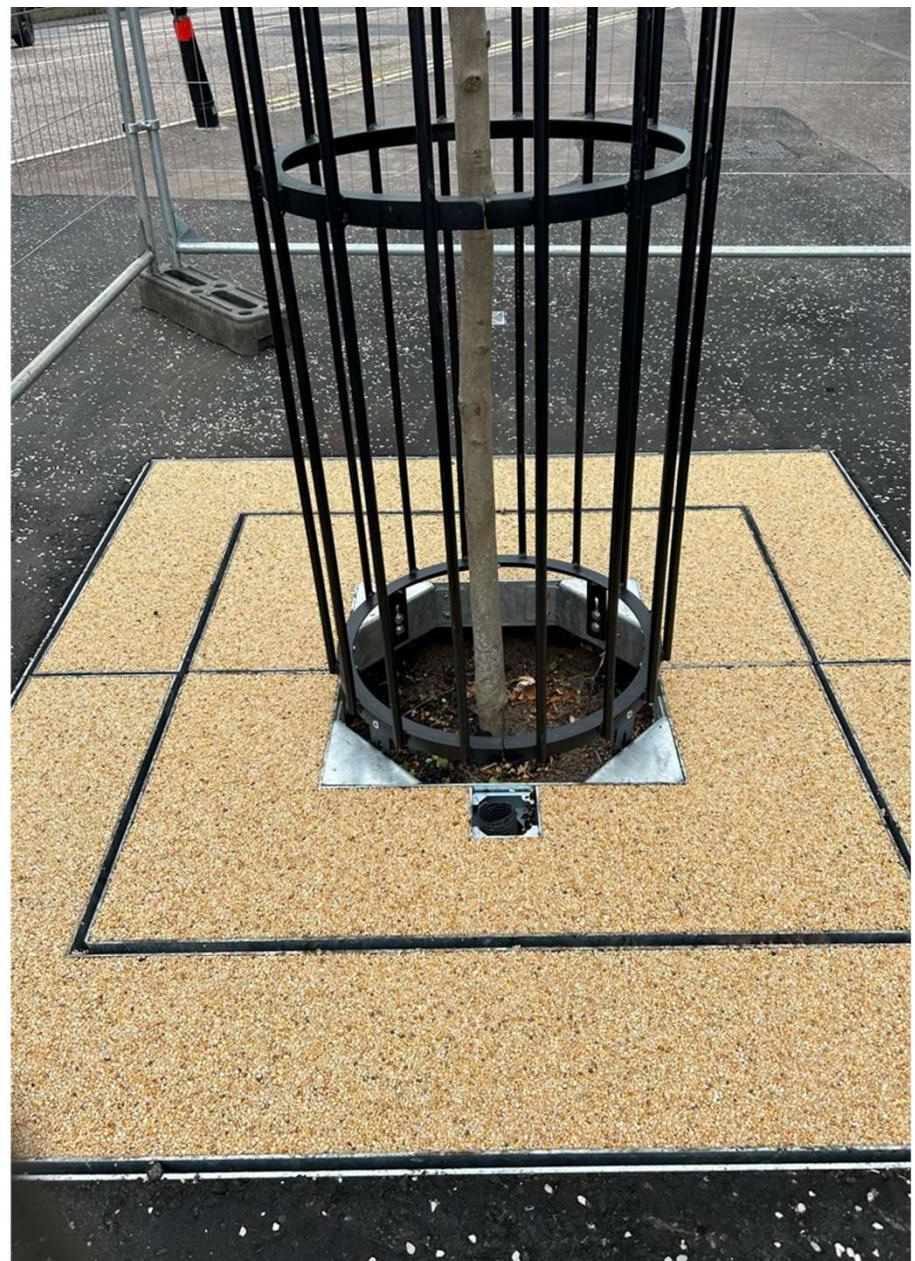
Indicative Blue-Green Networks (BGN) that could be created by the opportunities





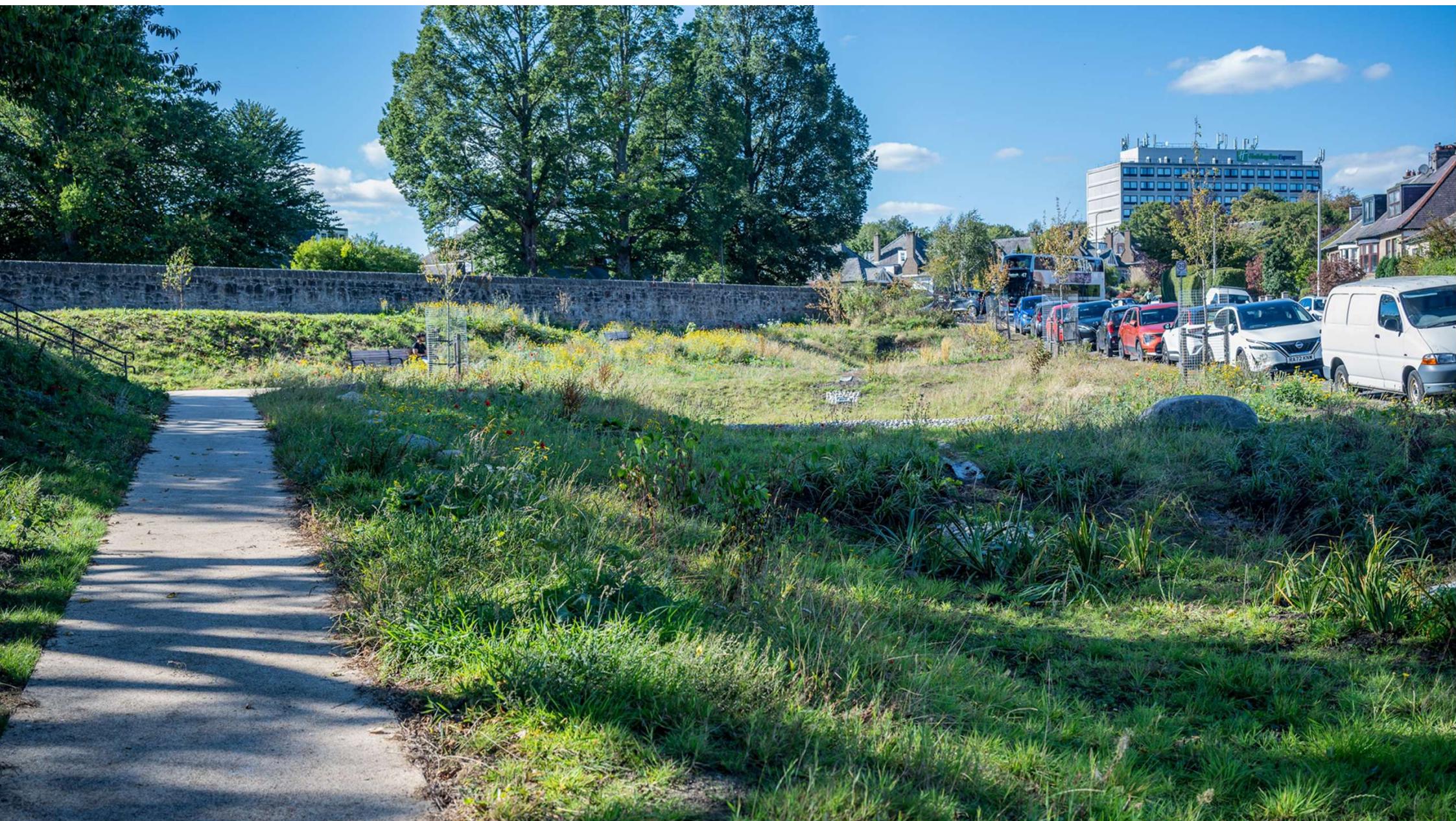


















Water Resilient Dundee

Rene Sommer Lindsay, AtkinsRéalis

Dom McBennett, Scottish Water

City Wide Strategy

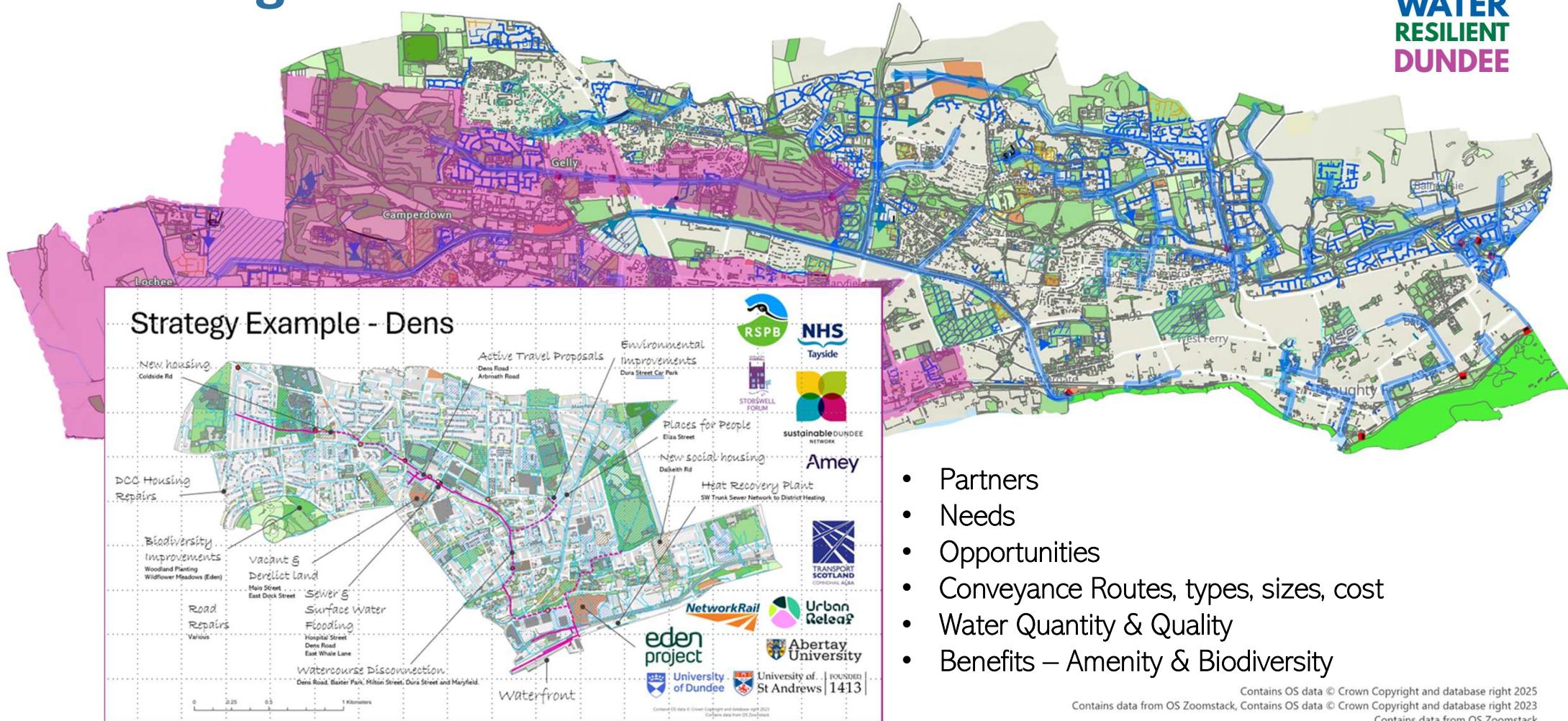
The 'Water Resilient Dundee' Strategy aims to transition from current drainage practices towards more holistic, sustainable, and adaptable water management across the city over the next 50 years.

Delivery of the strategy will involve utilising and, where required, reinforcing existing infrastructure alongside creating new assets. The new infrastructure must combine below-ground solutions with blue-green surface solutions that benefit the community and environment.



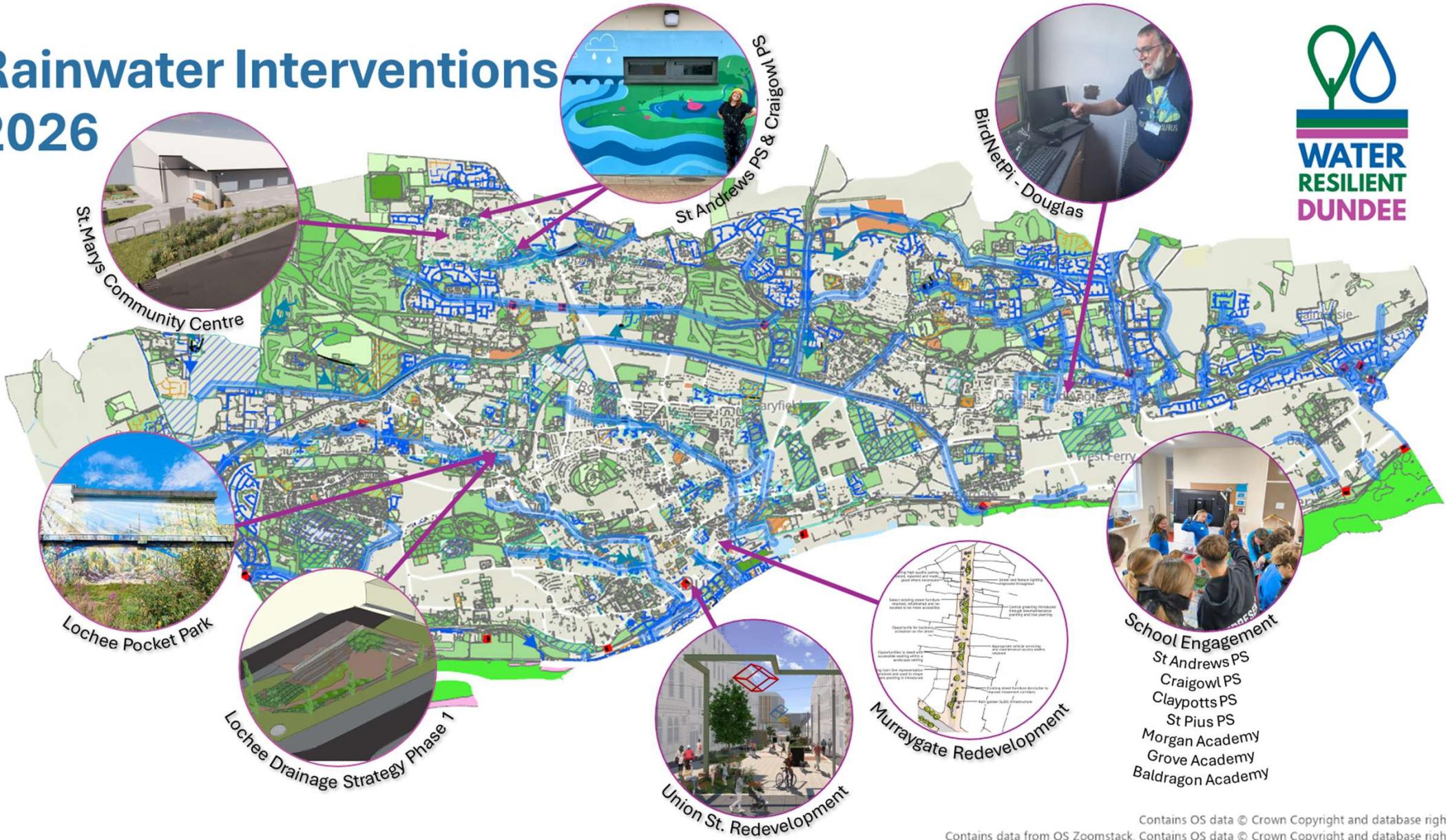
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www.waterresilientdundee.co.uk

Strategic Plans 2026



- Partners
- Needs
- Opportunities
- Conveyance Routes, types, sizes, cost
- Water Quantity & Quality
- Benefits – Amenity & Biodiversity

Rainwater Interventions 2026

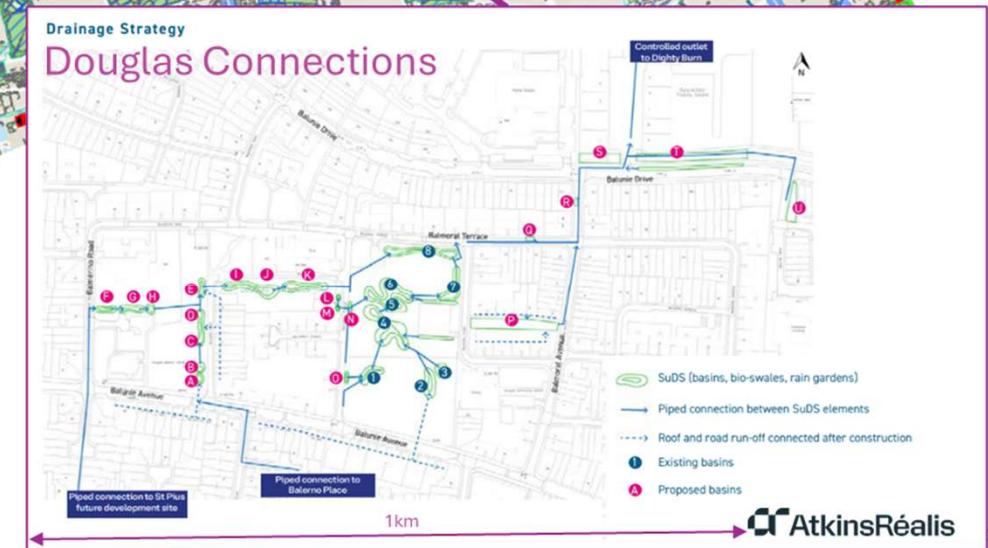
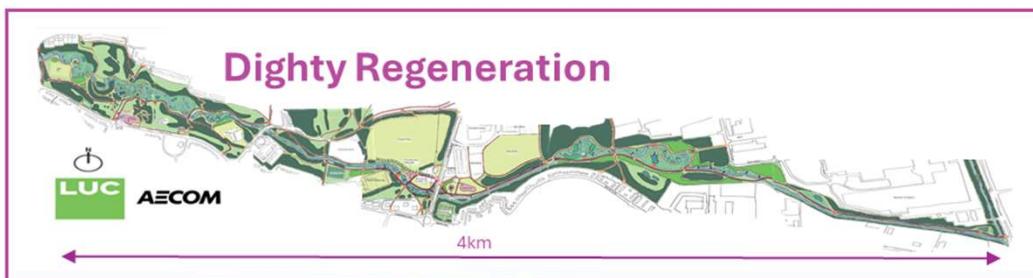
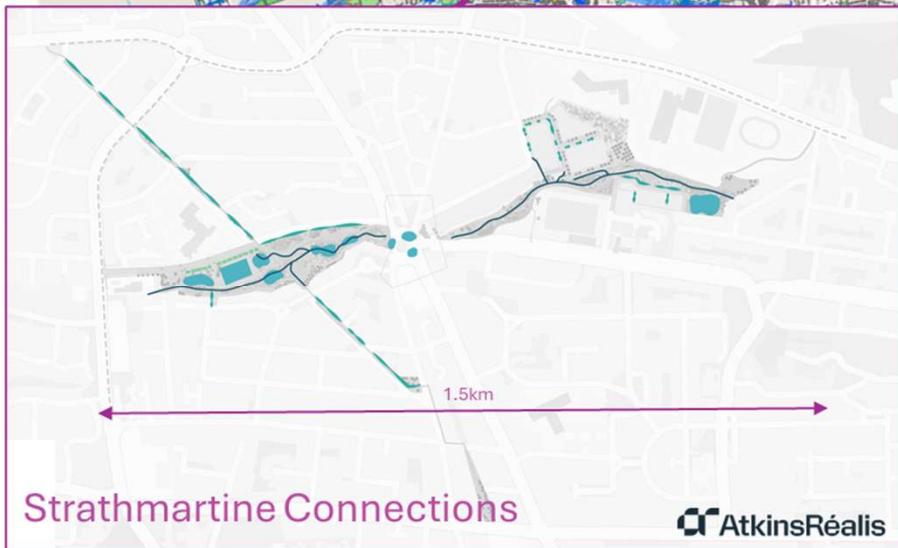


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Tactical Plans 2026



STRATHMARTINE CONNECTIONS

Part of Water Resilient Dundee

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GREEN DUNDEE



Balfour Beatty

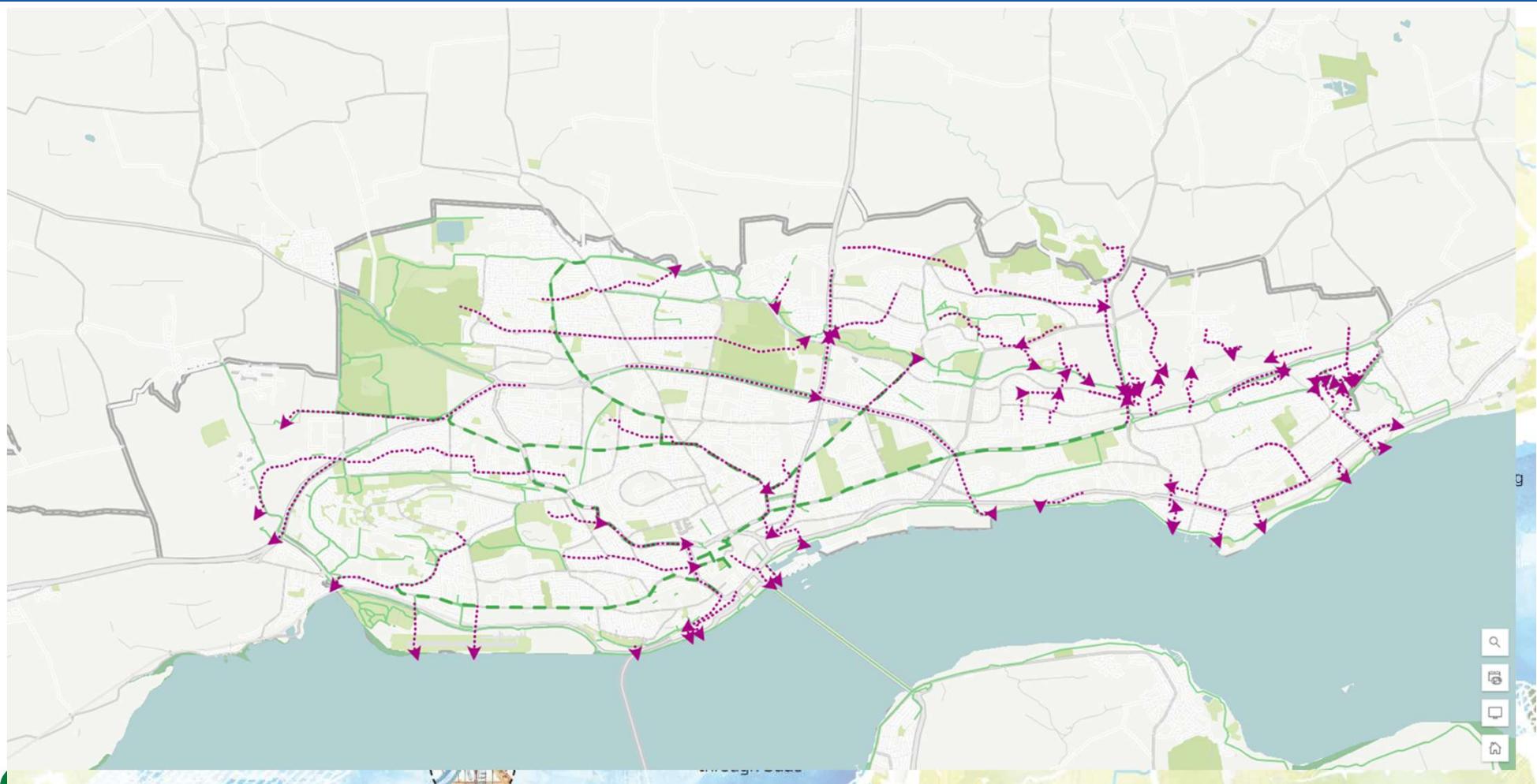
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STRATHMARTINE CONNECTIONS

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Balfour Beatty

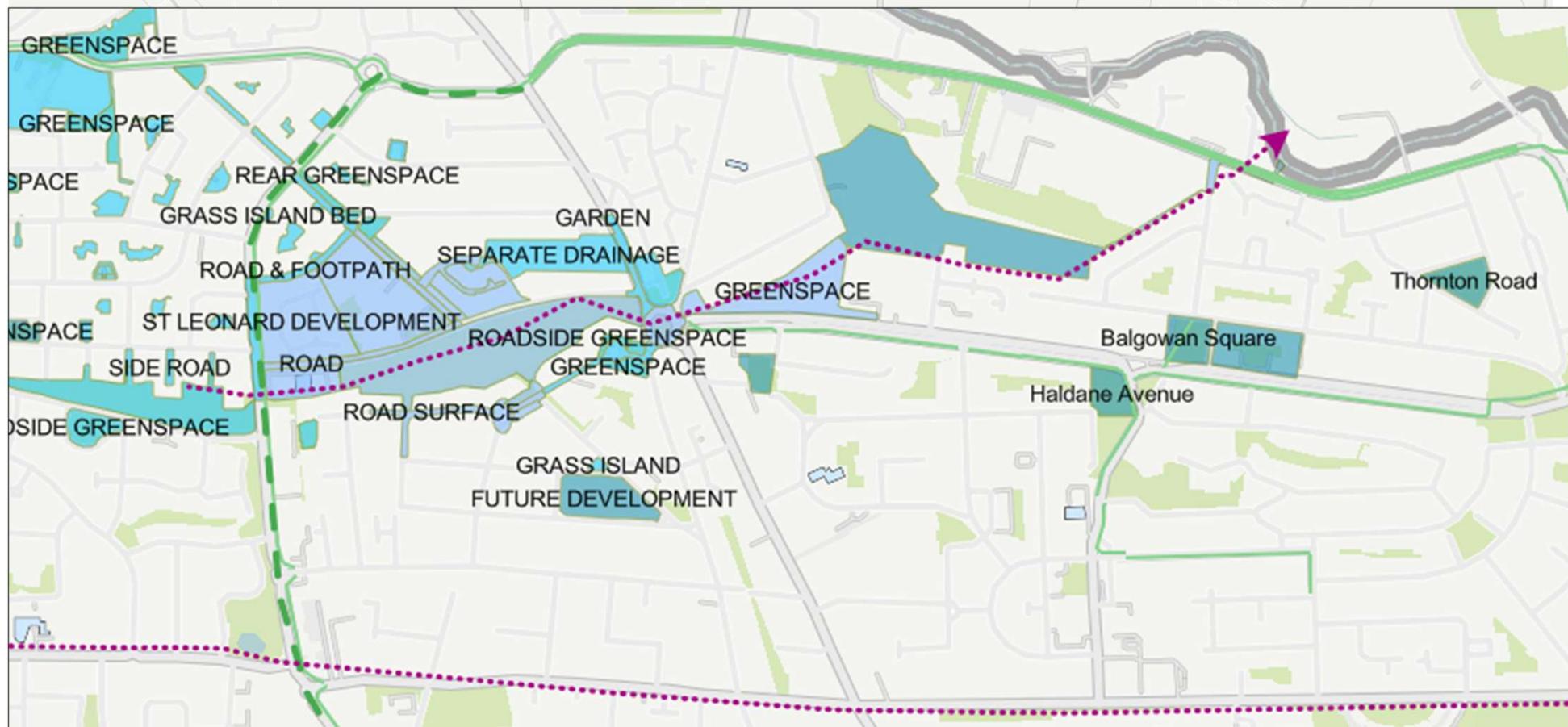
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STRATHMARTINE CONNECTIONS

Part of Water Resilient Dundee

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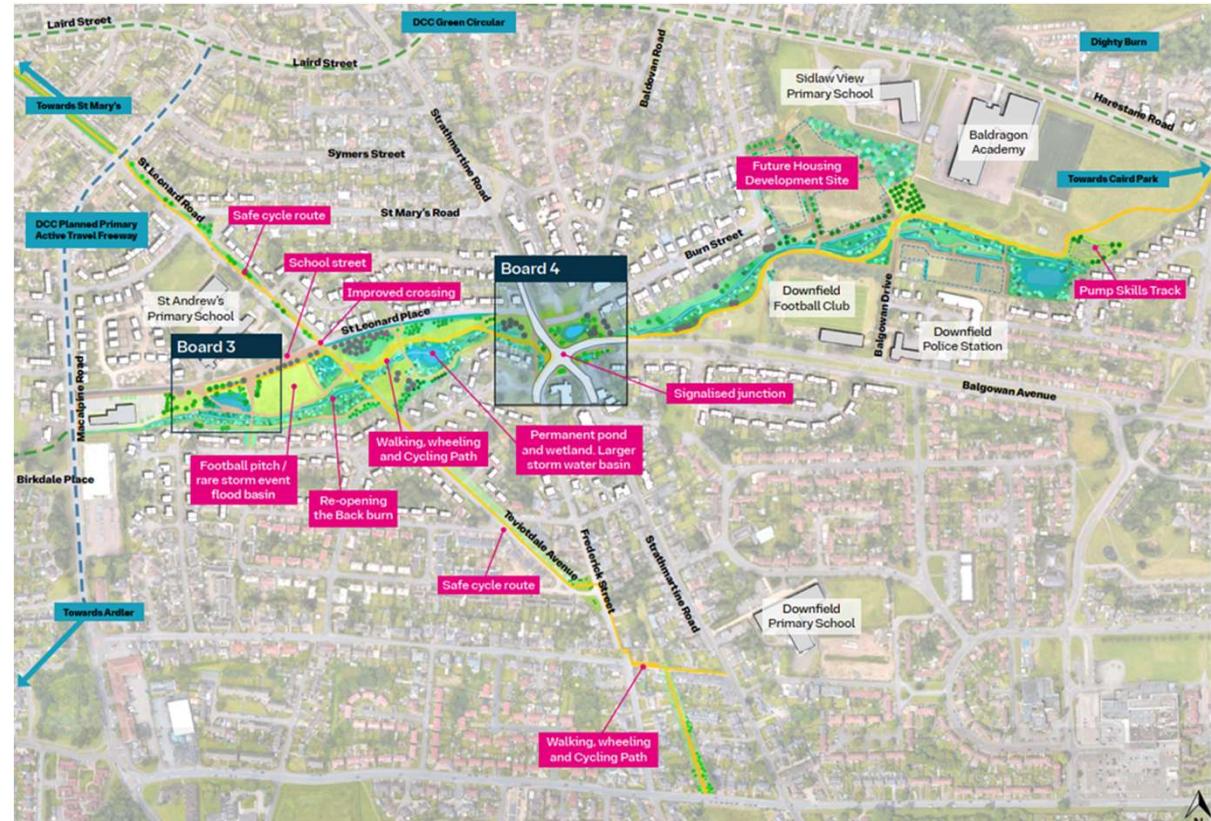
Landscape-led Regeneration



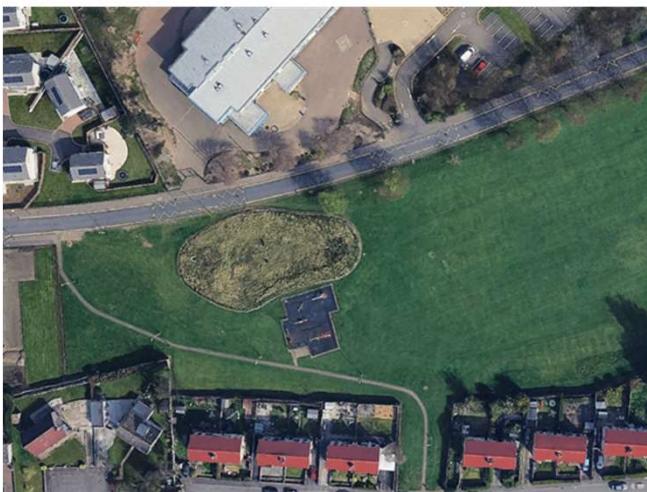
Strathmartine Connections

- St Mary's Drainage Strategy
- St Leonard Park
- St Andrew's Primary School
- Strathmartine Circle
- Housing Development
- Safer Cycle Routes to schools
- Tie-in to nearby Active Travel Routes

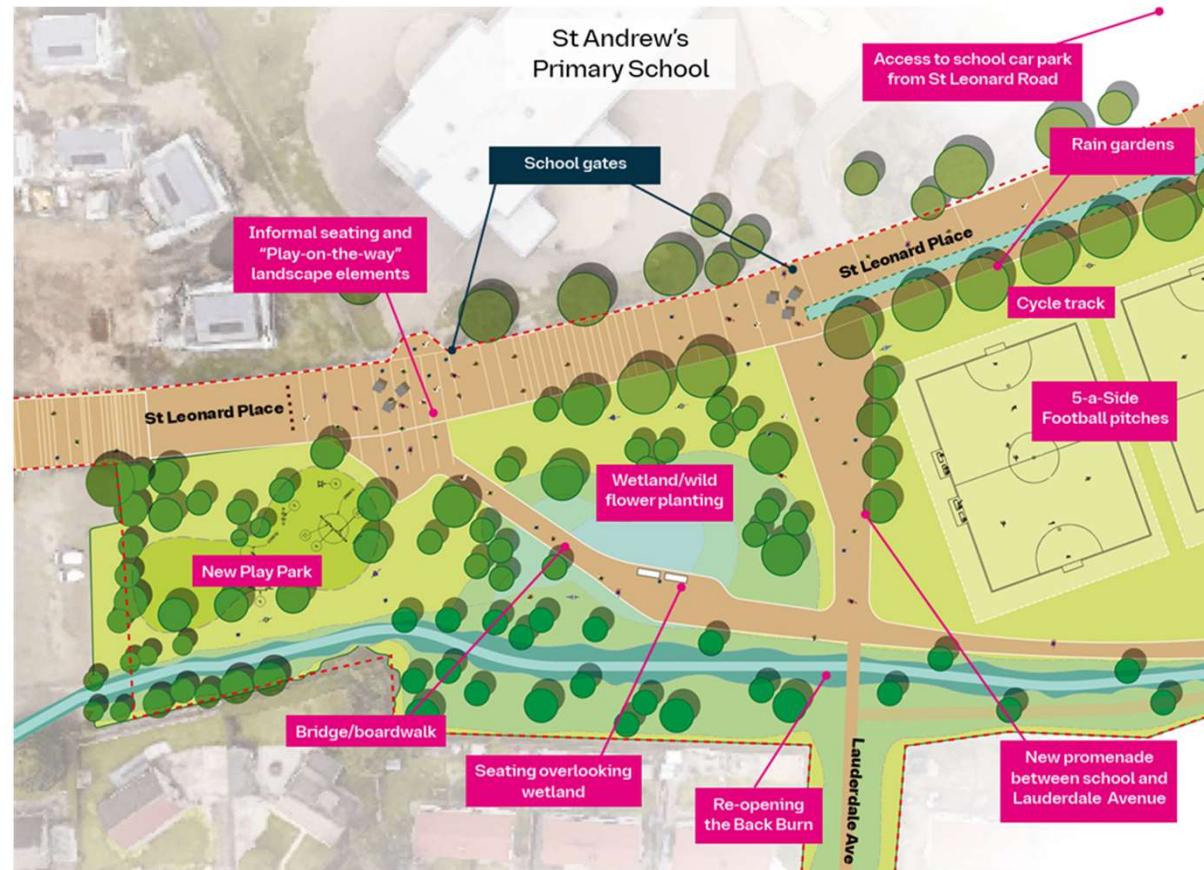
- Landscape-led Placemaking and regeneration as the project umbrella



St Andrew Primary



St Leonard Place: From rat-run to recreation



St Andrew Primary



St Leonard Place: From rat-run to recreation



STRATHMARTINE CONNECTIONS

Part of Water Resilient Dundee

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Strathmartine Circle



Re-designing an oversized, car-dominated road space into a multi-functional, accessible greenspace and active travel route



Balfour Beatty

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STRATHMARTINE CONNECTIONS

Part of Water Resilient Dundee

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Strathmartine Circle: from traffic-machine to drainage park



Water
Resilient
Dundee

Dundee
CHANGING
FOR THE
FUTURE

Scottish
Water
Always serving Scotland



Balfour Beatty

AtkinsRéalis



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Water Resilient Dundee

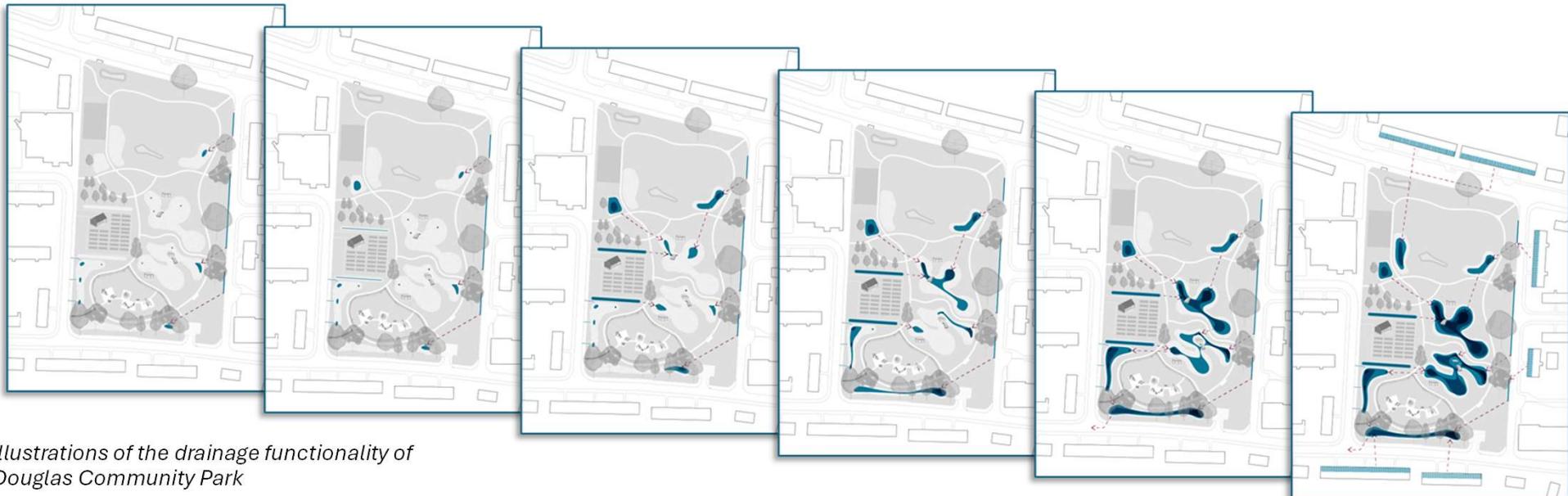
Making Climate Adaptation Relevant and relatable in schools and community.

Public consultations, schools engagement and participation in Family Fun Day



Water Resilient Dundee

Making Climate Adaptation Relevant and
relatable in schools and community.



*Illustrations of the drainage functionality of
Douglas Community Park*



Verture Conference 10/02/2026

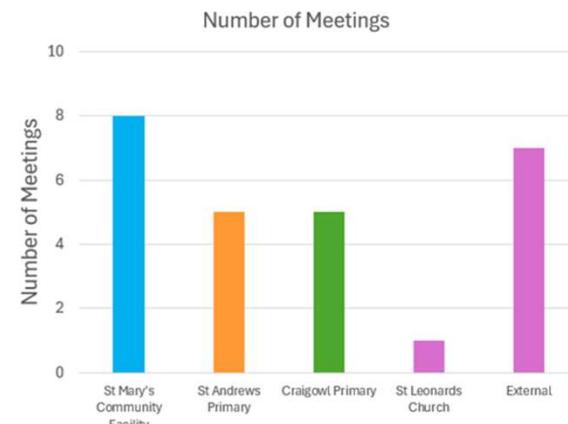
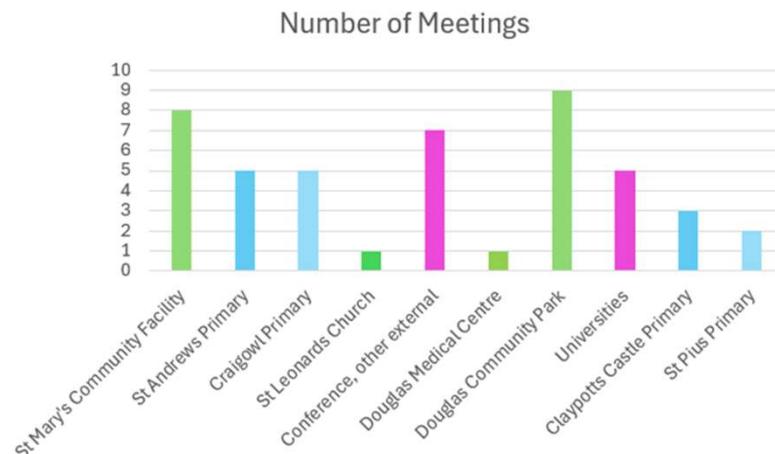


STRATHMARTINE CONNECTIONS

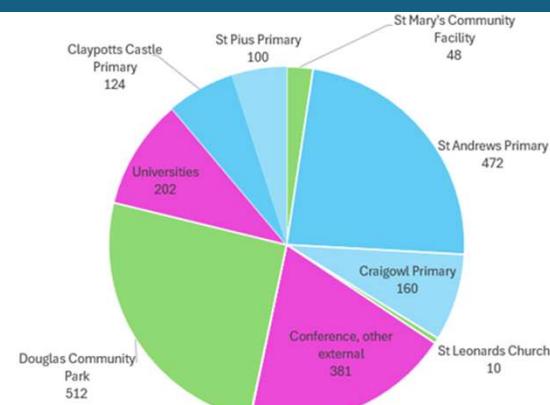
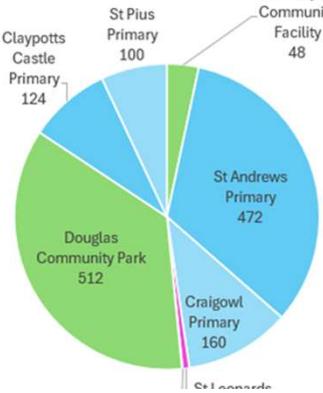
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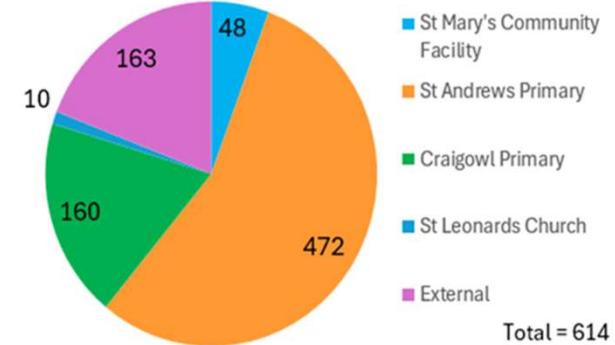
Engagement



Engagement conversations for Water Resilient Dundee



Engagement conversations for Douglas Park



Water
Resilient
Dundee

Dundee
CHANGING
FOR THE
FUTURE

Scottish
Water
Always serving Scotland



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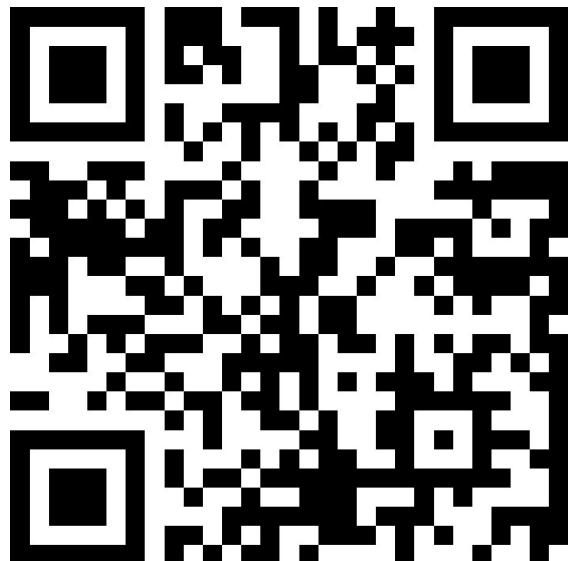


Plenary Discussion

Q&A



venture



Scan the QR code with your phone or tablet camera

OR

Log into a web browser and enter – www.slido.com and enter Floodresilience2026 in the box with 'enter code here'

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Refreshments, Market Place and Networking

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Scotland's Flood Resilience Conference 2026

Plenary Session – Learning from Practice

Chair: Peter Robinson, AECOM

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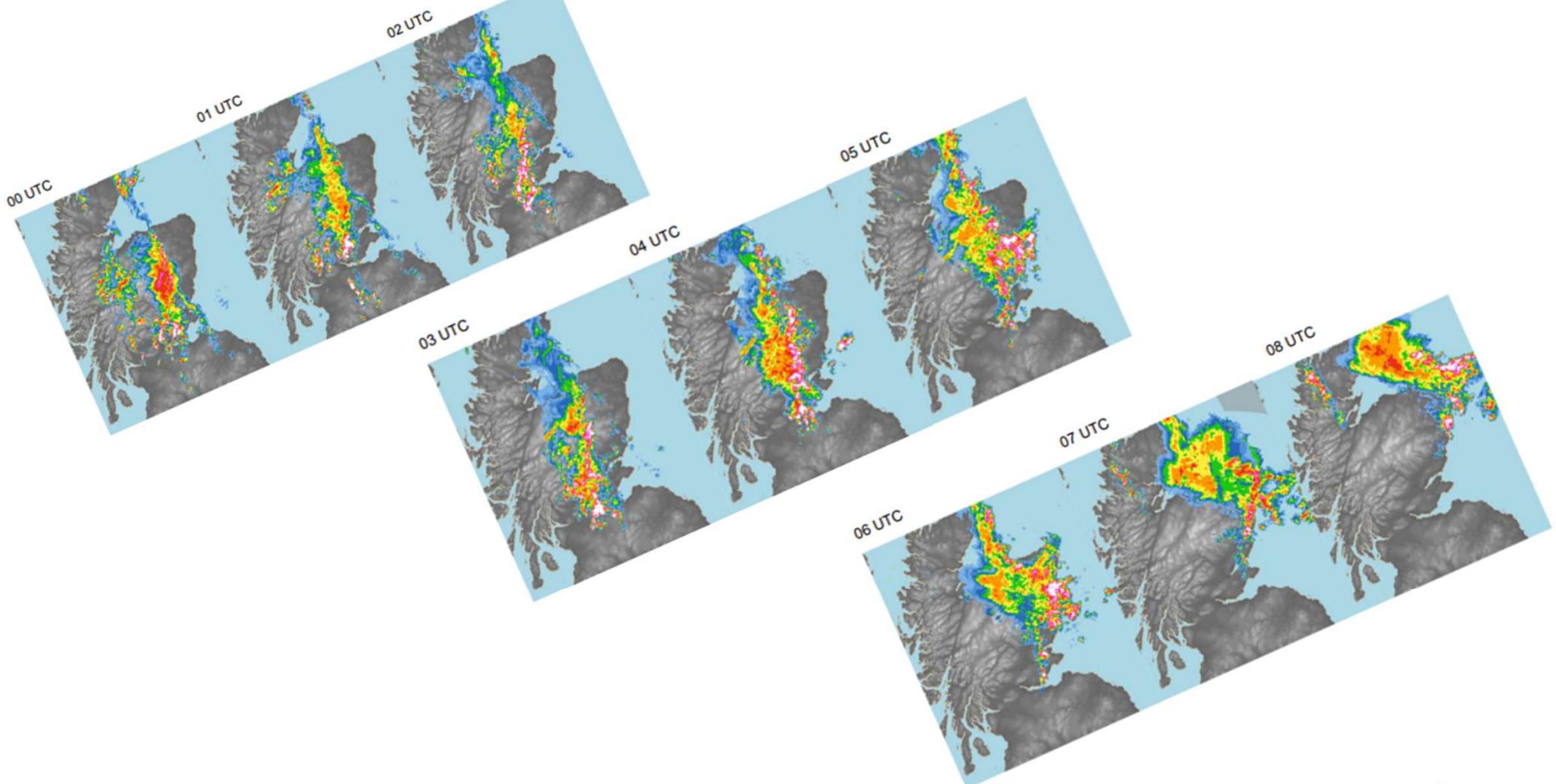
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Lived Experience of Flooding - An Infrastructure Perspective

The Union Canal Breach 2020

Peter Robinson CEng FICE
Technical Excellence Director, Water UK&I

Before we start... A reflection

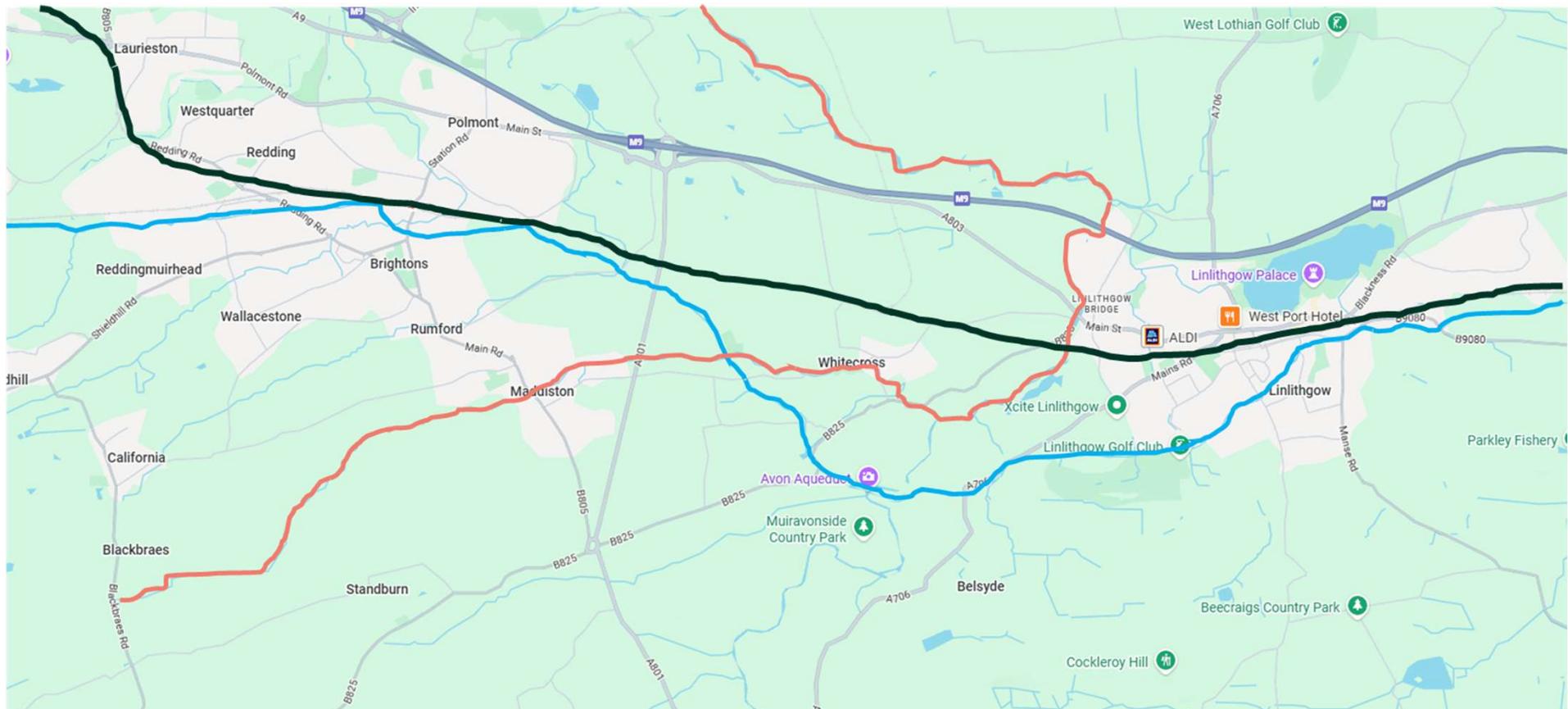


Ref: Met Office Summary of Thunderstorms 11-12 August 2020
Author: Mike Kendon, Met Office National Climate Information Centre

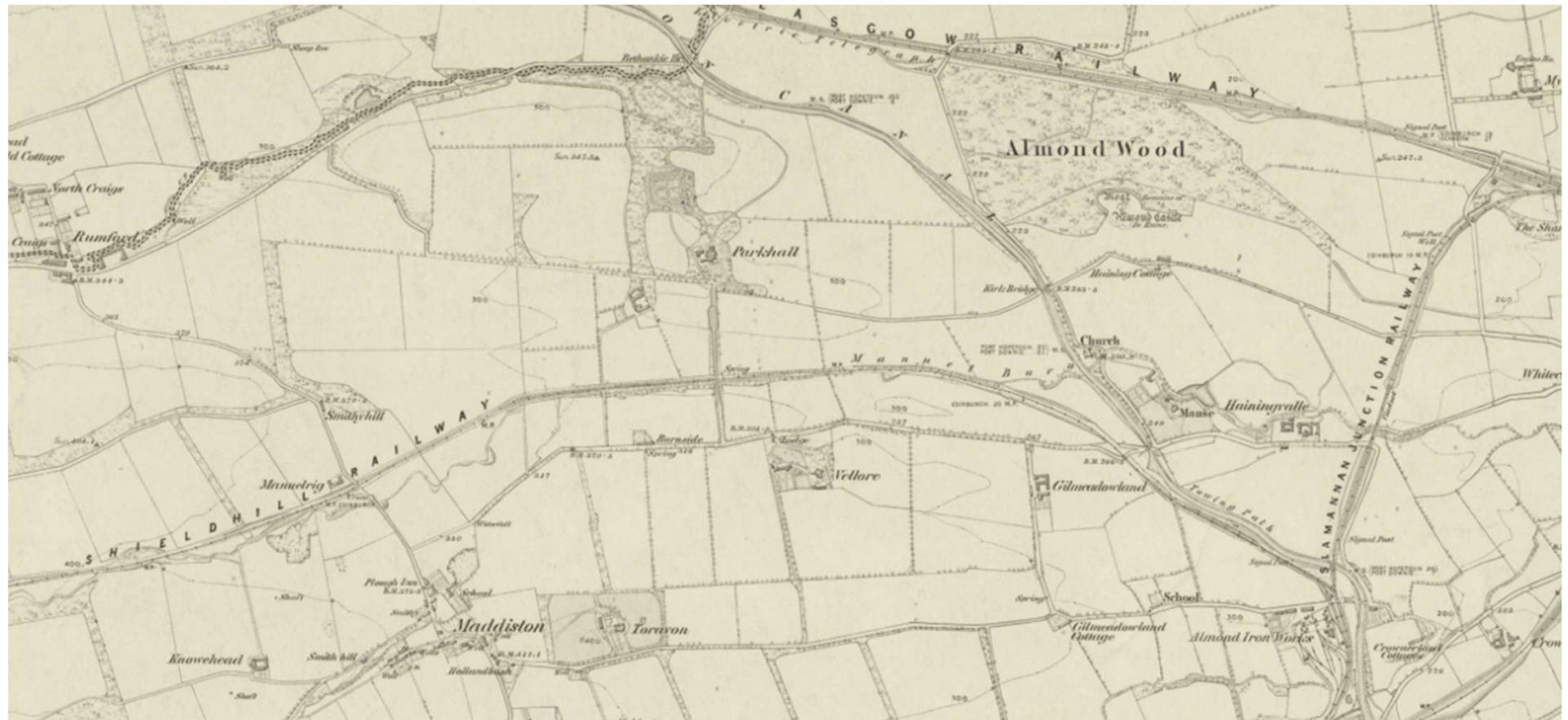
Scene Setting

- August 12th 2020
 - Between COVID Lockdowns
 - New WFH environment
 - Limitations on movement with essential works only
 - Furloughed resources
 - No vaccinations
 - Lockdown restrictions remained in Aberdeen

Local Geography

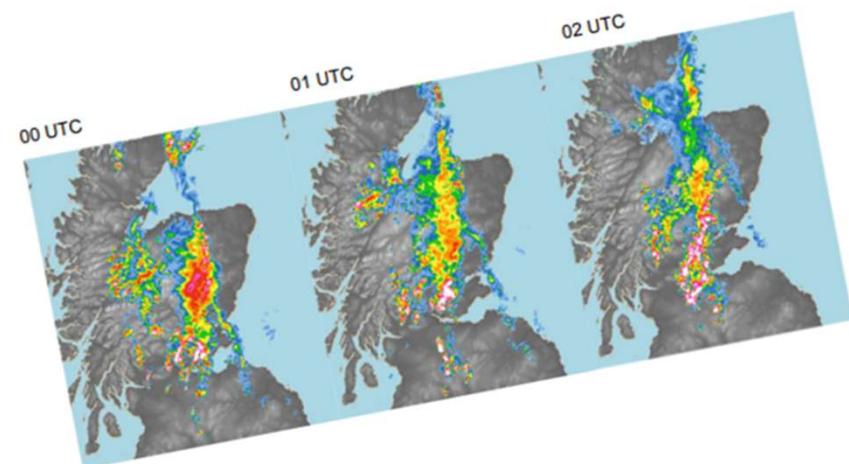
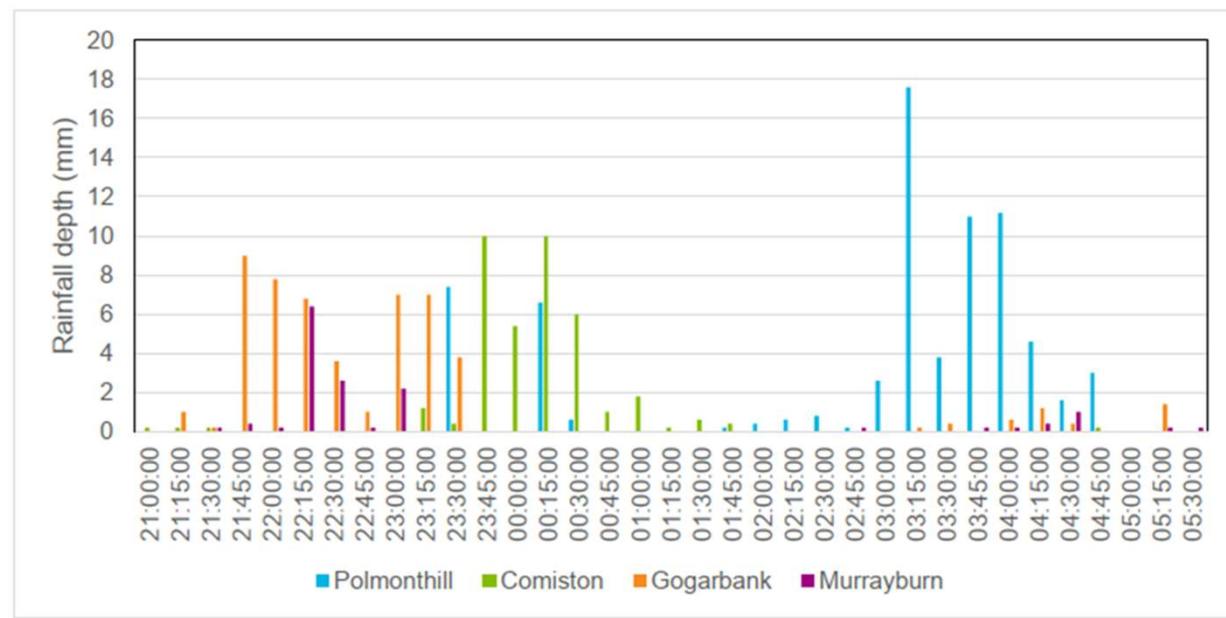


A historical perspective

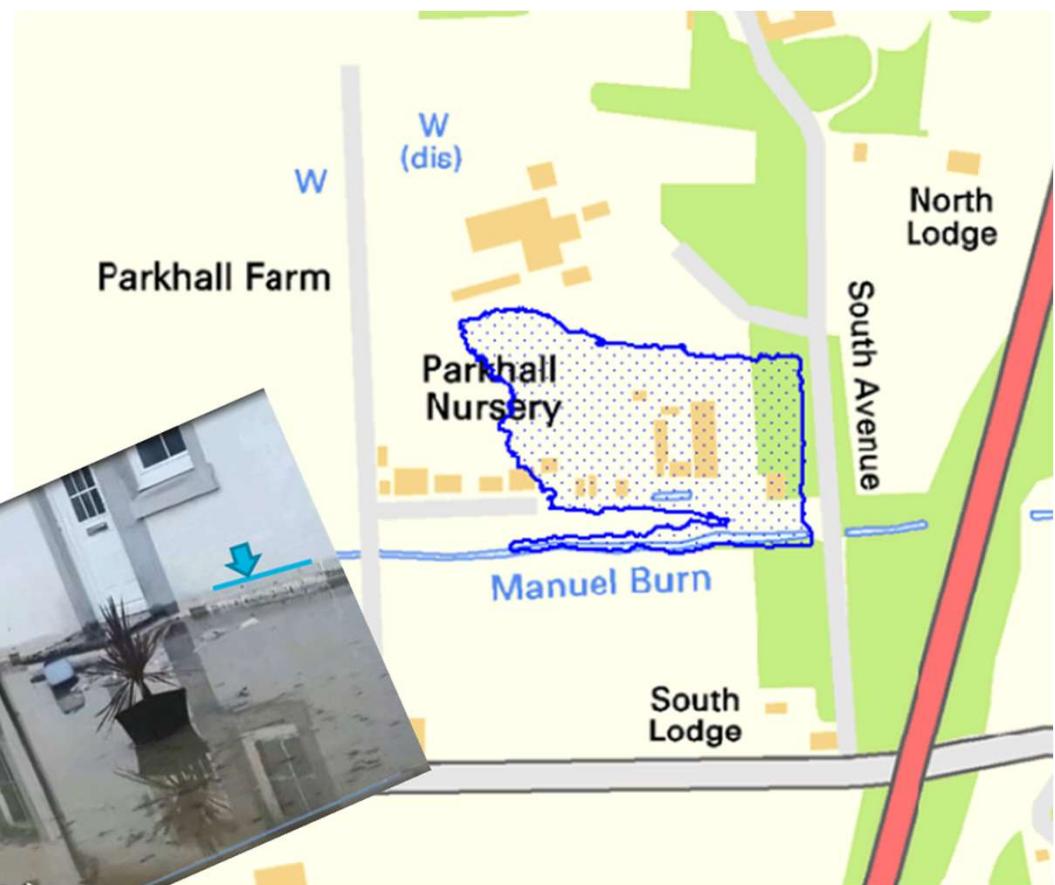


Storm Data

- 72.2mm in 5 hours exceeded August average monthly total
- 2 hours total of 55.4mm
- 1 in 240 year return period



Impact - Property Flooding



Impact - Canal Damage



Impact - Railway Damage



The Cause



The effect



Summarising the Causes

- Since 1822, when the Canal opened, the use of our landscape has changed.... A lot;
- Since 1822, the climate has changed.... Significantly;
- As society our asset base has grown... and so has our vulnerability;
- Investment in assets has been challenged;
- Asset ownership and risk is 'mixed';
- Our resources to manage our assets has been challenged;
- Our exposure to risks has grown;



So what can we do about it?

Thank you.

Improving Flood Resilience to Scotland's Distilleries

David Cameron, JBA Consulting



Improving Flood Resilience to Scotland's Distilleries

David Cameron BSc PhD MCIWEM CWEM CSci



Introduction

- Scottish whisky is essential to Scotland's economy, contributing over £5bn (Scottish Whisky Association, 2024: "Scotch Whisky's Economic Impact 2022")
- In recent years, existing distilleries have expanded production and many new distilleries have been developed.



Flood risk

- Key risk to many distilleries.
- Sources: fluvial, coastal, surface water and drainage.
- Climate change.
- Providing flood resilience while meeting crucial environmental regulations can be a significant challenge



- Port Ellen 2012 (source: <https://www.youtube.com/watch?v=Yt5oKHAoCqI>)

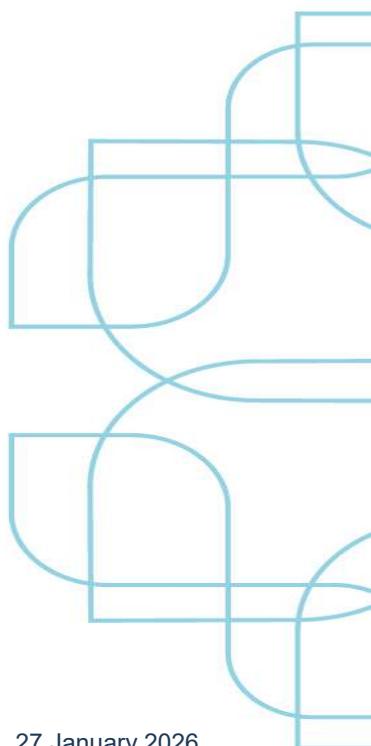


- Source: JBA image

Relationship to Scotland's Flood Resilience Strategy



- **People:** safeguarding jobs and communities: distilleries are a critical source of employment in many communities, often with small communities based around the distillery.
- **Places:** appropriate flood resilience must align with appropriate land management, including NPF4.
- **Processes:** implementing flood resilience at a distillery can require collaborative working with others.



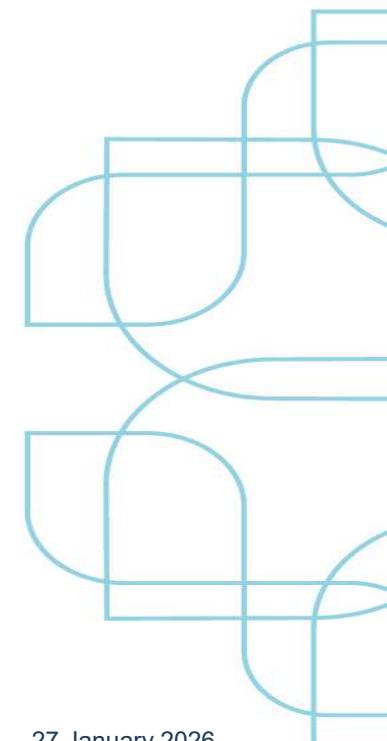
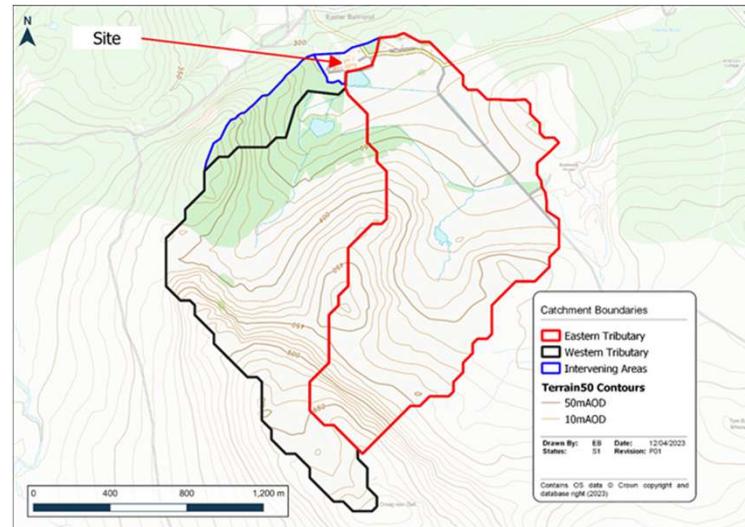
Flood resilience options (general)

- Avoidance (NPF4).
- Direct defences – but need to consider compensatory storage (where not coastal).
- PFR – can depend on availability of flood warning.
- Diversion - need to consider flood risk elsewhere.
- On site improvements e.g.
 - Drainage
 - Culvert sizing
 - Maintenance
 - Elevating equipment & materials



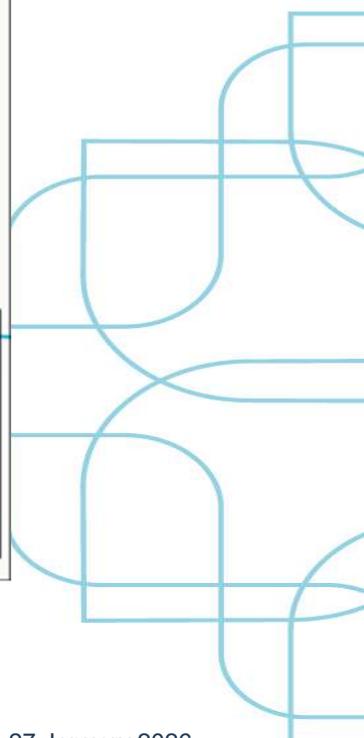
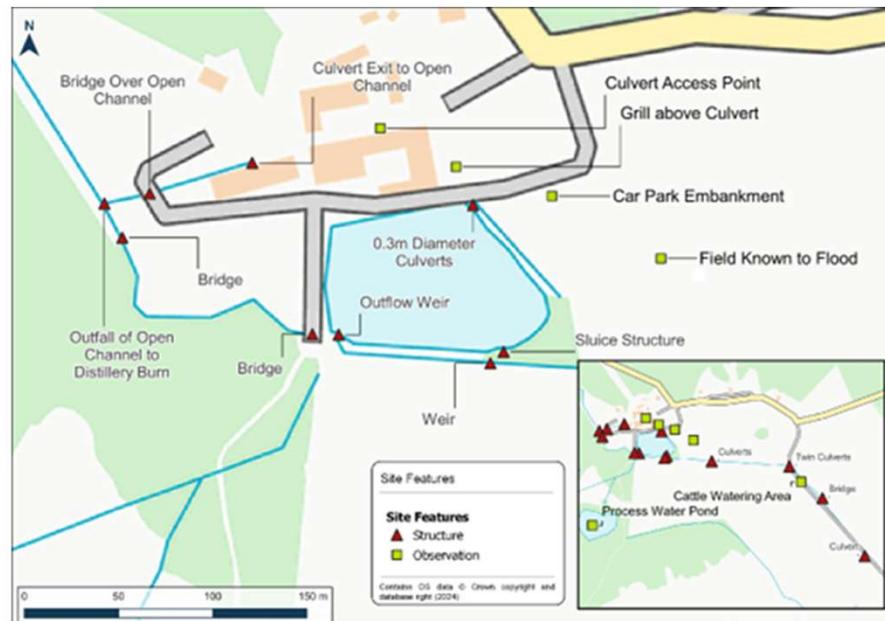
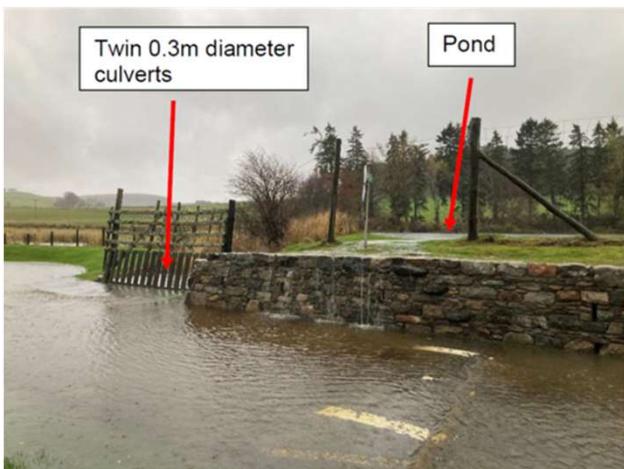
Specific Example

- Distillery at base of hillslopes.
- Distillery Burn discharges to large river further downstream.
- Distillery floods but no other receptors between distillery and river.
- Rural area.
- Important employer for local workers.



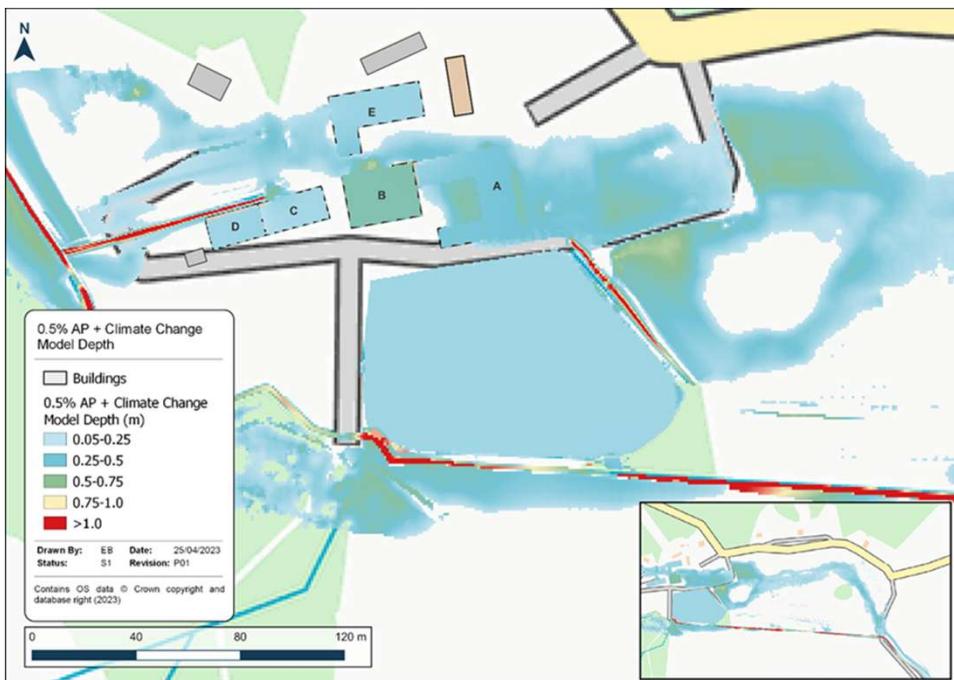
Sources of flooding

- Primary sources of flooding:
- Overtopping pond
- Undersized culvert
- Frequent flooding



Modelled flood extent

- 200 years plus climate change (1D/2D HEC-RAS)



Flood protection solution

- Culvert upgraded.
- Inflow to pond limited via automatic gate.
- Effective for reducing frequent flooding.
- Negligible downstream effect.



27 January 2026

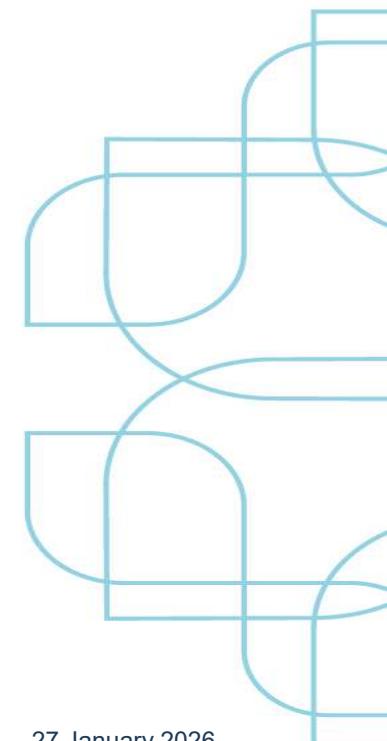
Other climate (water) resilience challenges

- **Water resources:**

- More varied supply.
- Longer dry periods.
- Effect on abstractable amounts, production and regulatory compliance.

- **Water quality:**

- Temperature rises.
- Effects on cooling water.
- Regulatory compliance.



Conclusions

- Distilleries are a key aspect of Scotland's economy
- Improving flood resilience is essential under a changing climate in order to help safeguard production.
- Other important water issues under climate change.



With thanks to: Diageo Ltd (especially Duncan Pirie, Environment Co-Ordinator) and Blyth and Blyth Consulting Engineers Ltd.

Panel Discussion

Prof Larissa Naylor, The University of Glasgow

Zoe Clelland, RSPB Scotland

Dr Fiona Henderson, Glasgow Caledonian University

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Scotland's Flood Resilience Conference 2026

Welcome and reflections from Day 1

Chair: Jo Kerr

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Plenary session - Engaging People

Chair: Carol Raeburn
Scottish Flood Forum

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Community Engagement at Scale

Alex McDonald
COWI

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The power of partnership working in supporting flood prone communities and delivering catchment scale change



Alex McDonald – Ecology & Biodiversity Lead, COWI (aemc@cowi.com)

Previously – Strategic Senior Advisor, Environment Agency (East Midlands)

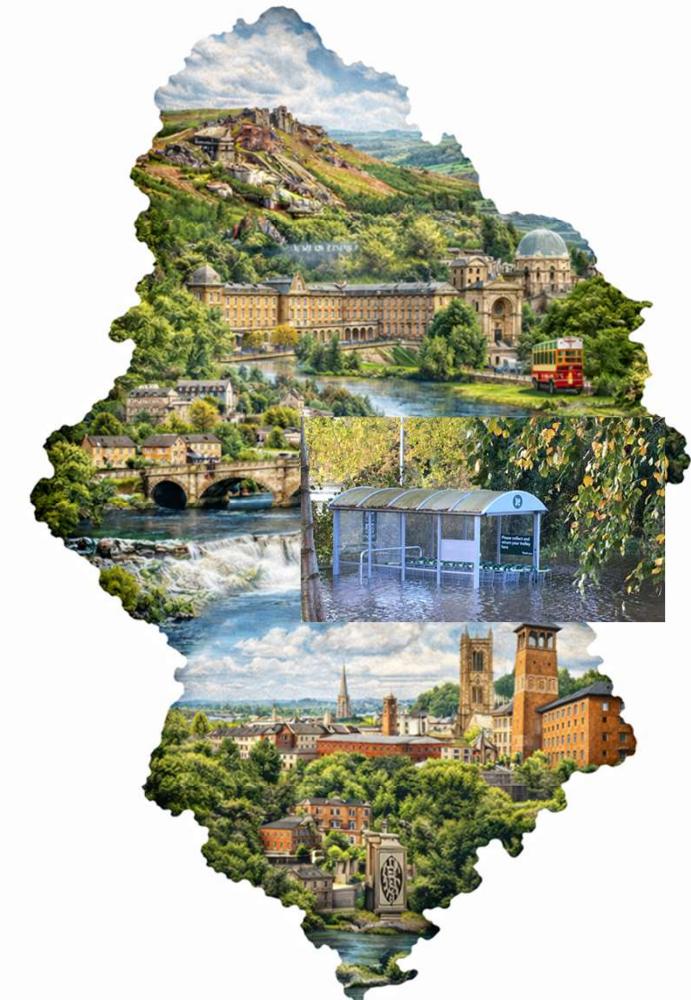
With thanks to – Fran Marriott PSO Team Leader, Environment Agency, East Midlands

COWI

Derbyshire & the East Midlands



Belper November 2019 (source: Environment Agency)



COWI

Flood Risk Strategy – Derbyshire



Increase flood warning sign up and expand service to smaller catchments



Property Flood Resilience for frequently flooded communities



Improve standard of protection for existing defences



Natural Flood Management in wider catchment

Partnership model



Strategic
partnership



Property Flood
Resilience



Fluvial & surface water



Sewer



Natural Flood
Management



Peatland



Derbyshire
Wildlife Trust

Lower catchment



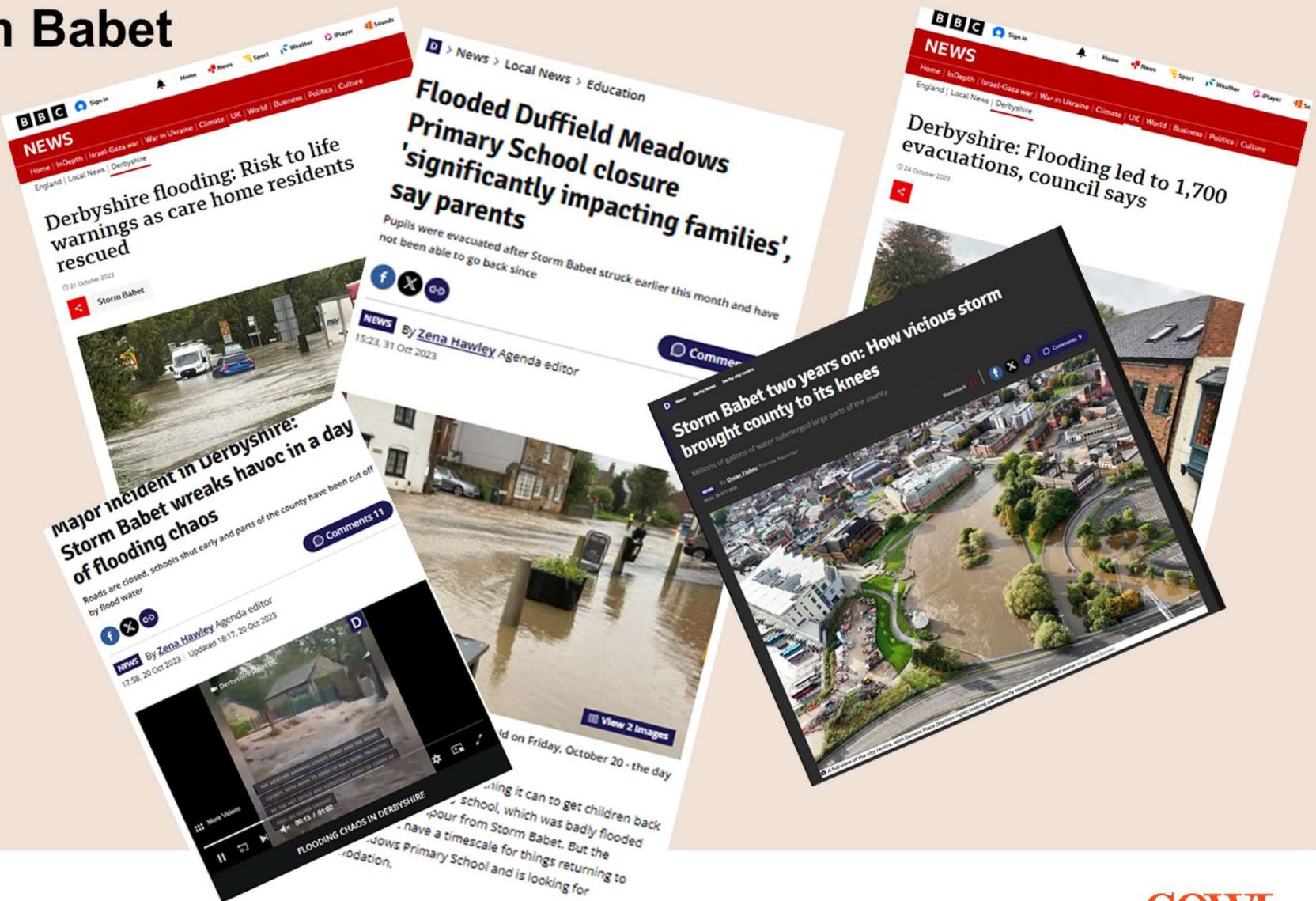
Landowners & land
managers

COWI

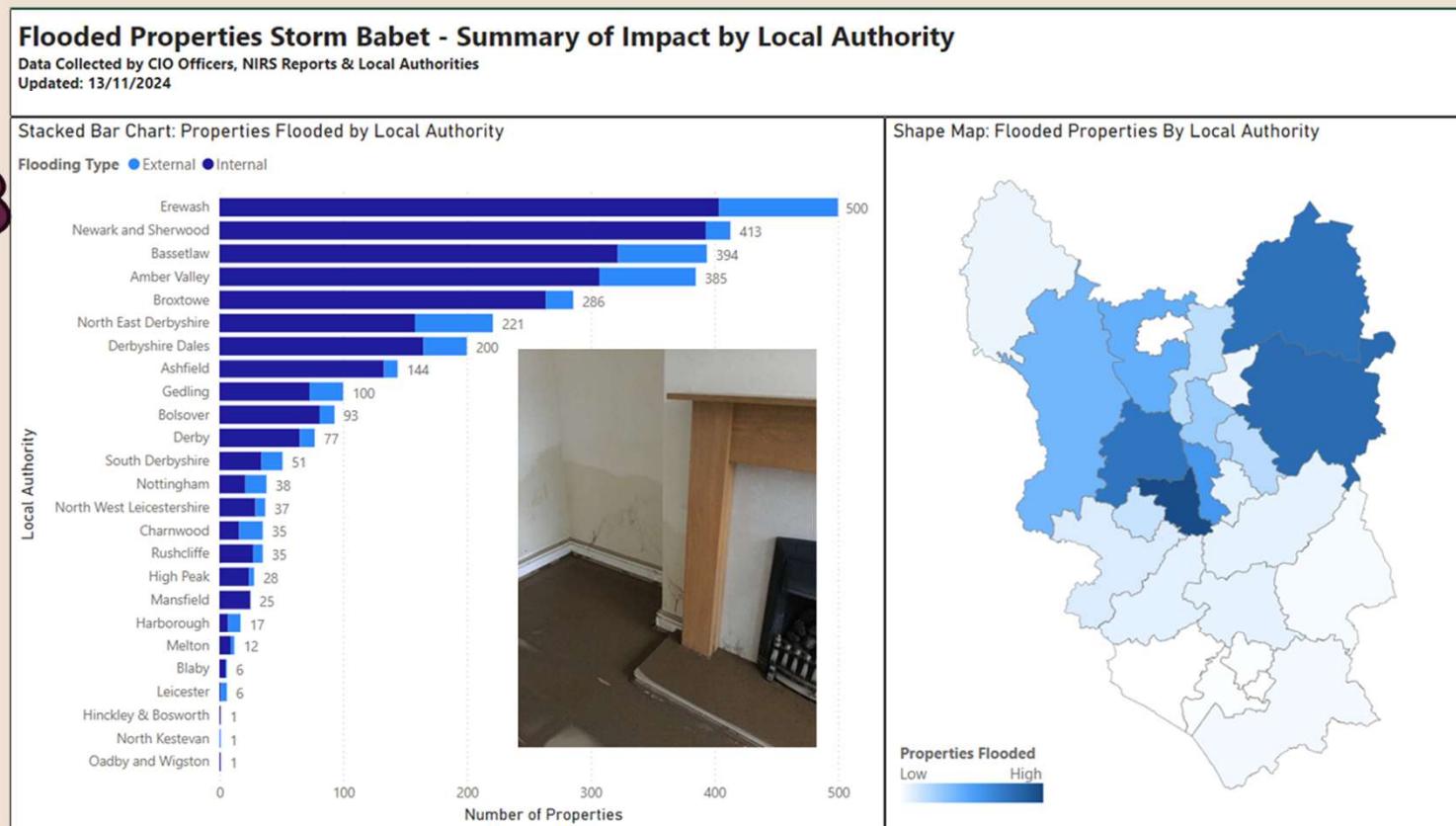
The test – Storm Babet



Storm Babet – October 2023



Collaboration in action



Community engagement



Invitations sent to residents



Residents attending drop ins

COWI

Legacy



Extended Property Flood Resilience
Programme



Increased support from larger
landowners into catchment based
measures



Partnership model for community engagement

Take home



“Dealing with flooded communities if hard but engaging with communities after a widespread flood event is especially challenging. There is mental and emotional impact. We need to make sure staff have sufficient and suitable support so they can continue to work with, and for, the communities that we serve.”

Fran Marriott

Embedding Flood Resilience in Placemaking and Collaborative Working

Clare Johnstone
The Conservation Volunteers (TCV)

How The Conservation Volunteers is working collaboratively to embed flood resilience in communities

by

Clare Johnstone

Scottish Community Flood Resilience Officer and EPIC Senior Project Officer

Martha Dickie
Volunteer Officer





Our goals

- 1 Protect and restore local environments
- 2 Empower others to take action for nature
- 3 Improve people's wellbeing through nature connection
- 4 Develop conservation and green skills



TCV Scotland Environmental outcomes 24/25

- 41,500 trees planted – creating new habitat...
- 40,500m² wildflower Meadow created or maintained – supporting pollinators...
- 29,000m² of invasive species removed – reducing monocultures, supporting native species...
- 43,000m² woodland managed – promoting understorey species and supporting healthy woodlands...



Martha - Volunteer Officer

- School leaver on a gap year
- Building:
 - Employability skills
 - Workplace experience
 - Knowledge on flood resilience
- Understanding how Government policies are implemented
- Interested in young people's involvement within climate discussions, and how we can contribute

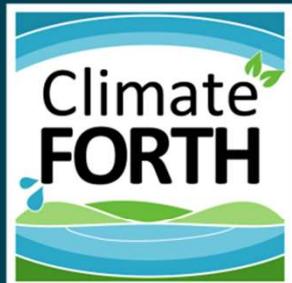


Clare - SPO Community Flood Resilience

- Partnership working:
Local Authority
Third Sector
Volunteers
- Examples of engagement, exploration, empowerment and embedding:
Primary Schools
Secondary Schools
Green Skills Trainees
- Lessons, Challenges and Next Steps



Partnership Working



Primary Schools

- Contributing to the Forth Climate Forest Project in Clackmannanshire planting 10 000 native trees

Banchory

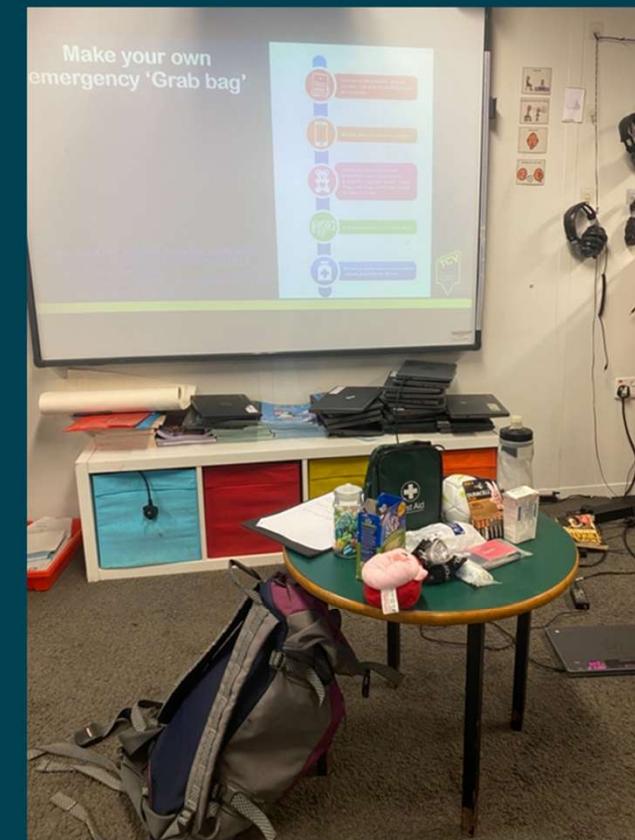
Coalsnaughton

Craigbank



- Part of Wilding Wee Spaces project, contributing to Edinburgh Nature Network

Colinton & Oxbangs



Flood Resilience & Adaptation Sessions for Communities



Engage: Presentation & emergency prep

Explore: Citizen Science & local flood risk

Empower: Outdoor mitigation and biodiversity enhancement

Embed: Share learning



Secondary Schools – Portobello High School



Secondary Schools – McLaren High School



Secondary Schools – McLaren High School



McLaren High School Pupils lived experiences



'Rooted in Nature, United in Community, Growing in Kindness.'



John Muir Way Green Skills Trainees

- 16-25 year olds facing barriers to employment
- Connecting wildlife corridors, people to themselves and nature along the John Muir Way
- Learning green skills to manage local landscapes



JMW Green Skills Trainee Sessions

- Classroom learning:
 - Flooding types
 - Emergency grab bags
 - Soil components
- Field Trip
 - Stages of a River
 - NFM Techniques
 - Community Resilience



Lessons Learned JMW Green Skills Trainees



Young people and nature are key ways to embed community flood resilience

- Young people are interested in flooding and environmental efforts and are currently taking climate action
- Support and opportunities allow us to explore flood resilience as a career prospect and deeper interest
- We will be the ones growing up with the impacts of our changing climate, so we should be confident in adapting positively to this



Thank you

Clare Johnstone

Clare.Johnstone@tcv.org.uk

Martha Dickie

Martha.Dickie@tcv.org.uk





Coastal Community Engagement

Greg Guthrie
Haskoning





Different times, Different people,
Different Issues

Difficult Decisions

Greg Guthrie
28 January 2026

Scotland's Flood Resilience Conference 2026



Coastal Change

has happened
is happening
will continue to happen

1903



How do we involve and support communities in discussion of and agreement to fundamental change?

- Pushing at an open door – steering adaptation.
- Facing reality – appraising realistic opportunities
- Planning a different future – readiness for change.

1990



2050 ?

2100 ?

2126 + ?

Coastal erosion is progressive and (typically) irreversible

Coastal flooding No longer being on an extreme event but part of everyday life.

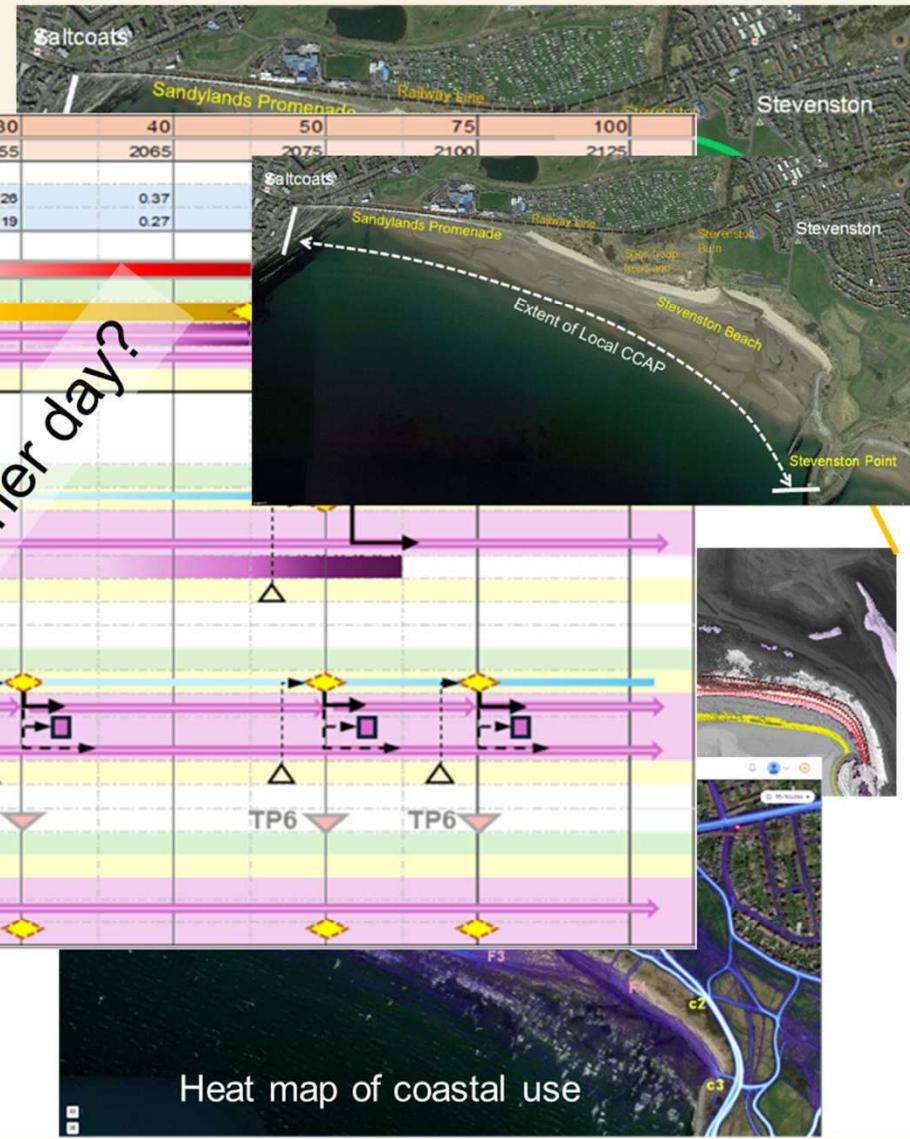
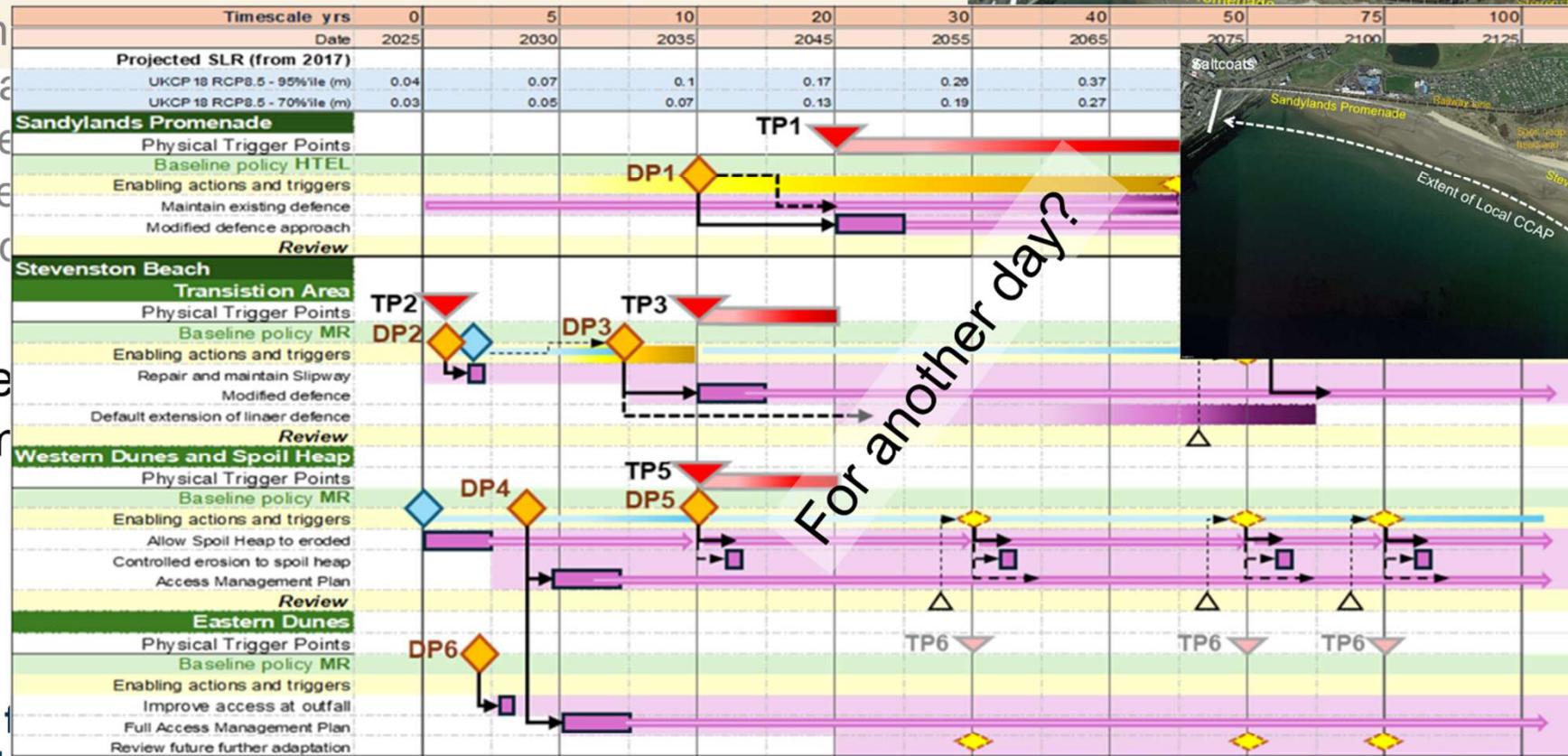
North Ayrshire CCAP – Stevenston Beach

Moving on
HTL over a
to examine
a more me
understand

For Steve
management

Moving on to
means and now we can support adaptation.

Shift in focus, providing communities with a better
understanding.



Northumberland – Low Hauxley

Why us ? – why are you imposing change on us

Why can't **you**?

What could **we** / should **we** do?

Full appraisal of possibilities

- Understanding the implications / costs and impacts
 - Allowing involvement in decision making

But framing the discussion in reality

Community empowered to take Ownership

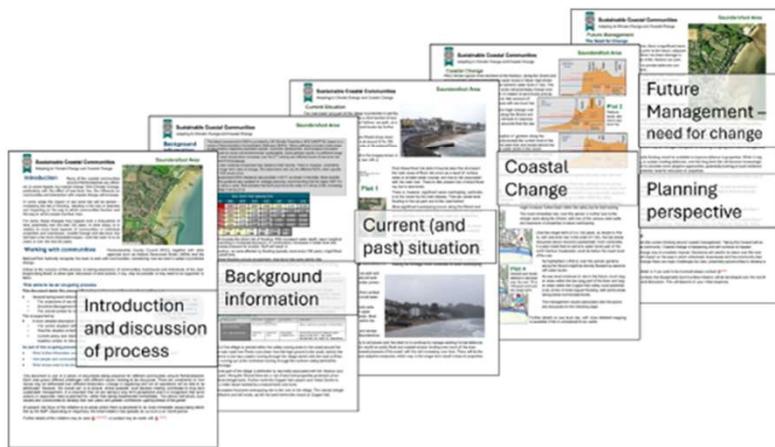
A realistic partnership approach led by the community with Local Authority support



Pembrokeshire – Sustainable Coastal Communities

Working with County Councillors and the Community Councils –

- What did they need?
- How should we be communicating?
- What further information?

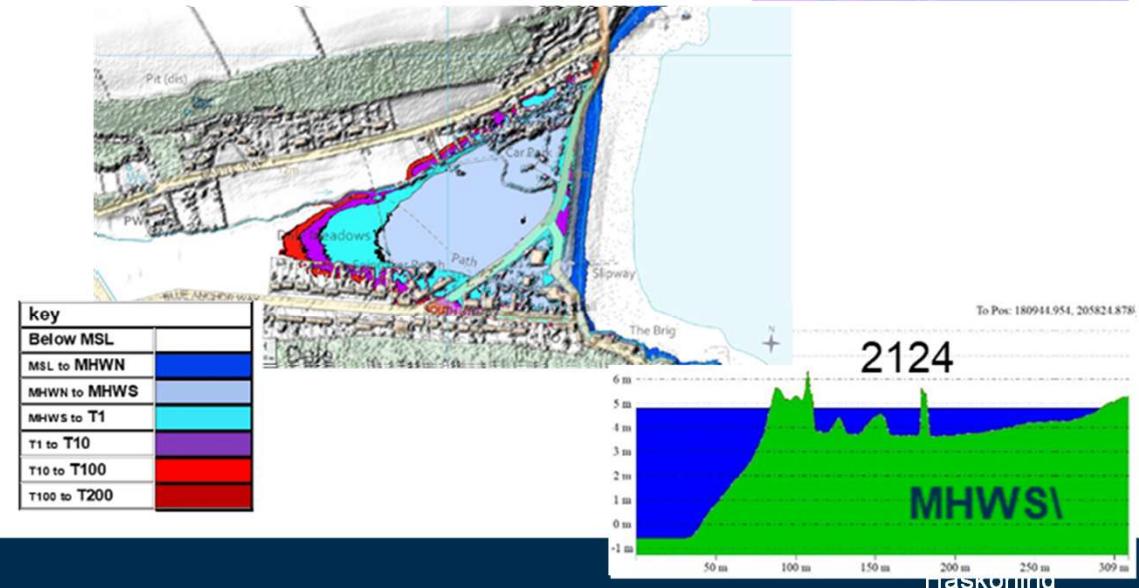
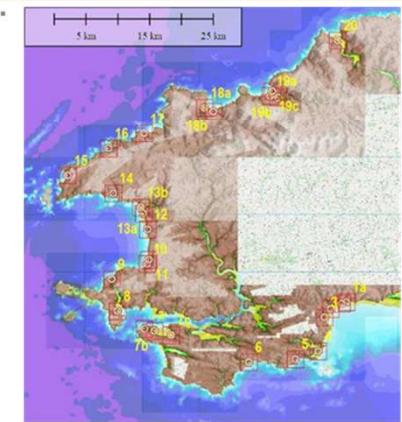


Using the SMP to provoke the discussion and frame the issues.

Longterm initiative

- Raising awareness
- Improving readiness
- Encouraging thinking about different futures.

Potentially some 30 communities impacted by coastal change and sea level rise to varying degrees with the need to adapt.



In the past change happened – by default one stormy night?

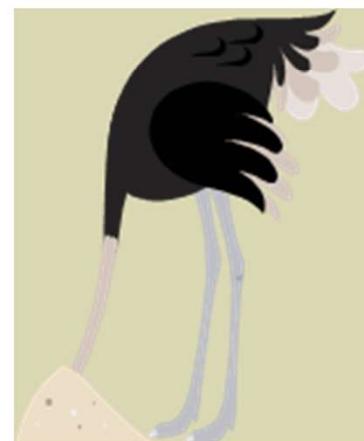
We need to get ahead of the game!

Using information to empower decision making.

Honest early discussion

Framing the challenges in reality but remaining open to alternatives

Adaptation is an ongoing process and this requires time, resource and a very different way of thinking.



How far have we progressed in taking this forward in practice?



Acknowledgements

Marc Miller & Jack Nicolson - North Ayrshire Council

David Green & Nick Watson - Northumberland Council

Angharad Llewelyn & Steve Benger - Pembrokeshire County Council



Thank You

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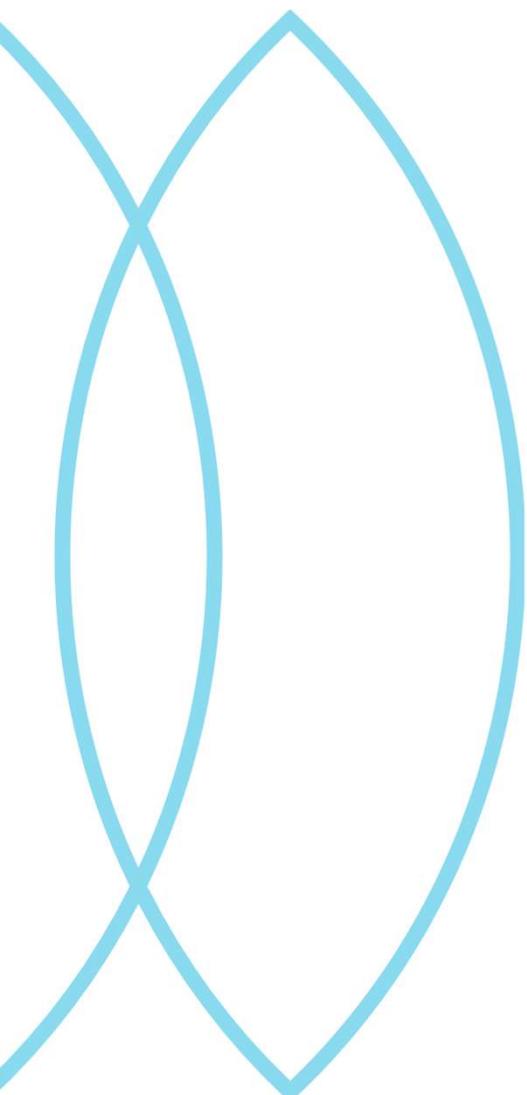
Coastwise Graveyard Transition Options

Pippa Lawton-Van Kuijk
RPA

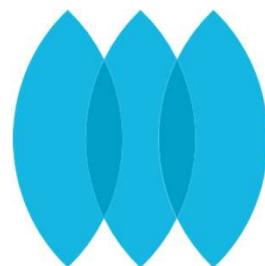
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COASTWISE



RPA
Risk & Policy Analysts



Coastwise Graveyard Transition Options: Resting places on the edge

Flood Resilience Conference 2026

January 2026

Pippa Lawton-Van Kuijk on behalf of Daisy Copping

Principal Consultant and Head of Environmental Risk



Flood and coastal resilience innovation programme

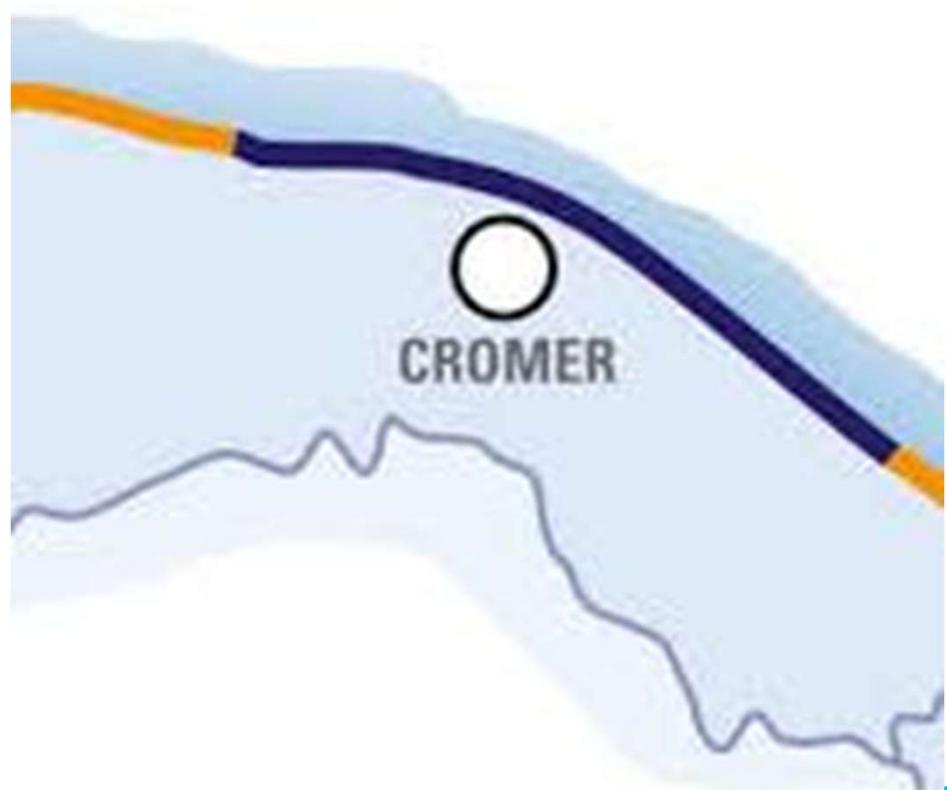
Part of the £200m
Flood and coastal innovation programmes

Coastwise: Part of the Coastal Transition Acceleration Programme

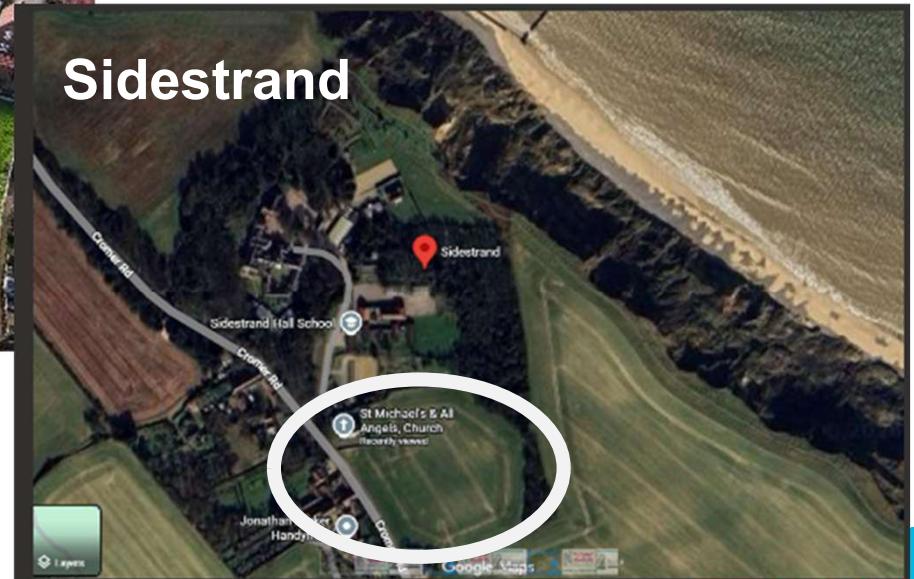
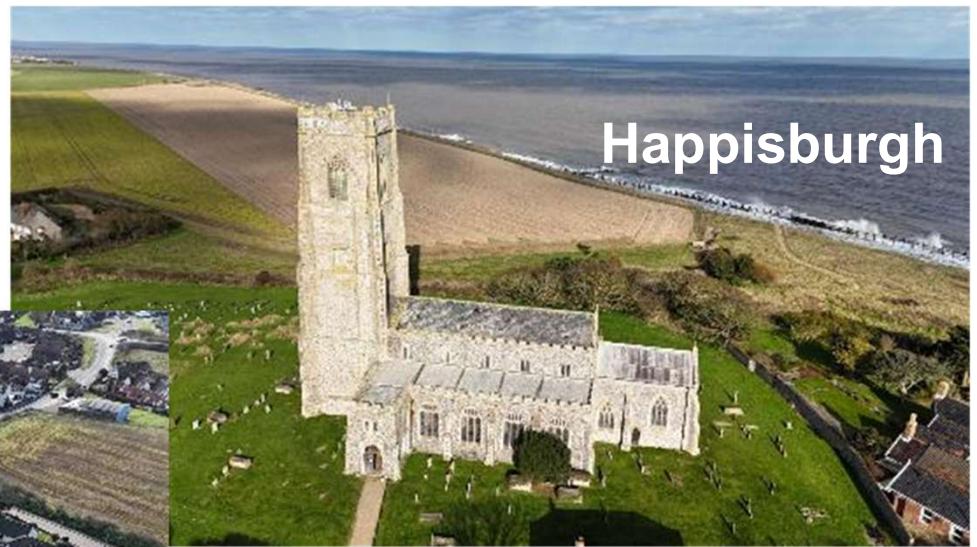
Funded by Defra as part of the £200 million Flood and Coastal Innovation Programmes, which is managed by the Environment Agency. The programmes will drive innovation in flood and coastal resilience and adaptation to a changing climate.

Coastwise is:

- Preparing for coastal erosion in North Norfolk
- Helping prepare communities between Weybourne and Happisburgh, where the coast is experiencing erosion
- Exploring how coastal places can plan and deliver practical projects to prepare for coastal change
- Informing and influencing national and local policy, strategies, plans and processes for coastal management
- Capturing learning from North Norfolk to support other local authorities with an eroding coast, allowing them to be better resourced and prepared



Our churchyards at risk in Norfolk



Why are we doing something?

- Graveyards along the coastline are at risk of coastal erosion
- Many of the graveyards at risk on the North Norfolk coast are still active and hold great local significance

What are we doing?

- Our project investigated factors that need to be considered when assessing potential future impacts and possible management responses

What will it give us?

- A way forward to consider how to manage graveyards at risk from loss due to erosion but also...
- Helps us to start to think about other risk (landslides, reoccurring flooding ...) and how we manage these types of features

Options considered

Do-minimum	Defend	Cease use and close	Relocate	Long-term management
<ul style="list-style-type: none">• Keep the site open and continue burials, responding to health and safety risks as they arise.	<ul style="list-style-type: none">• Protect the site from erosion in line with policy, if feasible, acceptable and justified.• Offers a short-term solution.	<ul style="list-style-type: none">• Reduce new burials over time and eventually close the site	<ul style="list-style-type: none">• Exhume and transfer burials to another site, either existing or new.• Locations may vary case by case.	<ul style="list-style-type: none">• Accept gradual loss of burials over time, after steps like closure or relocation.• Focuses on managing erosion impacts with clear protocols in place.

Why does this matter beyond Norfolk?

Final resting places

- For those that were laid to rest, families believed that this would be their final resting place, which now will be disrupted

Planning and collaboration

- Preparing for the possible loss of resting places is a sensitive issue
- This needs to be addressed with careful planning and co-production with communities
- This will ensure that options available to these areas are feasible, ethical and produced in collaboration with all stakeholders

Challenges in delivery

- Failure to give attention to these sites in FCERM management can result in circumstances that organisations cannot come back from
- Action without consultation could result in legal disputes, negative media coverage, personal anxiety and loss of trust with official organisations

Resting places on the edge: questions for our FCERM community

How do we approach these challenges?

What are the barriers?

And what are the opportunities?

A footer can be used if needed!

For more information
about this project,
scan the QR code to
access the published
report



Thank You

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Daisy.copping@rpaltd.co.uk



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Household Flood Plans in Scotland

Fiona Henderson

Glasgow Caledonian University



Household Flood Plans in Scotland: Applying behavioural learnings to inform best practice and uptake

Fiona Henderson¹, Rhian Thomas², Tony Craig³, Bridget Bennett¹, Alice Hague³,
Rhiannon Hawkins², Róisín Dooley-Nealis¹ and Abby McAllister³

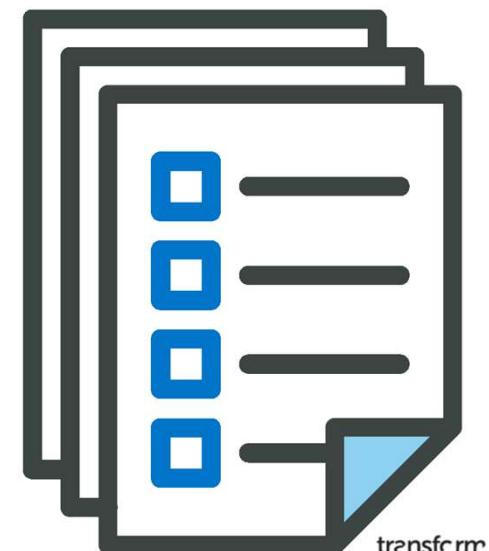


University for the Common Good



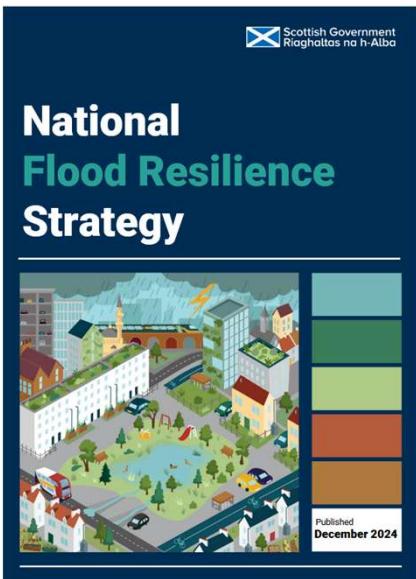
Today's presentation

- Background and context
- Aims and timeline of the project
- Phase 1 Methods
- Existing Examples Portfolio analysis
- Behavioural insights



National Flood Resilience Strategy

‘The four guiding principles laid out in the Strategy will help us to make the most of all the resources available to us.



1. The scale of the challenge means that the focus of action will change from ‘fixing flooding problems’ to creating flood resilient places.
2. Flood resilience is part of community resilience and part of adapting to climate change.
3. At the heart of our flood resilience activities will lie the principles of a Just Transition (to secure a fairer, greener future for all by working in partnership to deliver fairness and tackle inequality and injustice).
4. Everyone benefits from flood resilient places, and we all have a contribution to make.’

p.7 *National Flood resilience Strategy* Scottish Government 2024)

The need for a Scottish Household Flood Plan

- Flooding in Scotland is likely to become more frequent and increasingly severe. ([UK Climate Risk 2021](#))
- By 2080, the number of properties at risk of flooding in Scotland will rise from 284,000 today to almost 400,000. ([Scottish Government 2024](#))
- In Scotland, peoples' awareness of flood risk remains low. ([Henderson et al. 2022](#))
- While **50%** of households expect to experience flooding in the next 5 years where they live...



...only 3% of households have installed any flood resilience measures. ([Scottish Climate Survey 2024](#))

Aims of this project:

Phase 1 Aim:

- Apply the latest behavioural science evidence when co-developing a household flood plan template with individuals and communities.

Phase 2 Aims:

- Consider what future actions could support the uptake of household flood plans;
- Increase the number of households completing household flood plans.

Project Steering Group



Project Timeline



Phase 1 Methods: Creating the Household Flood Plan

- Compiled and analysed an Existing Examples Portfolio of household flood/emergency plans & guidance (n=69).
- Completed a literature review of the latest behavioural science evidence around household flood planning and other related resilience behaviours.
- Conducted interviews and workshops with individuals (n=73) to co-develop and feedback their thoughts on iterative draft plan statements, particularly around:
 - Tone and language used.
 - Emotions generated.
 - Amount of information included and relevance.
 - Graphics, format and visuals.



Existing Examples Portfolio: Five themes



- 1. Cognitive** factors – risk perception; motivation; mental health; ability to cope.
- 2. Social** connections – engagement with others; contacts; trusted messengers.
- 3. Physical** tasks – moving people, pets, items; physical health; preparing the house (installing measures, turning off services).
- 4. Financial** aspects – insurance; purchasing PLFR measures; buying items for an emergency kit.
- 5. Temporal** differences ('calm weather') before/ during/ after flooding).

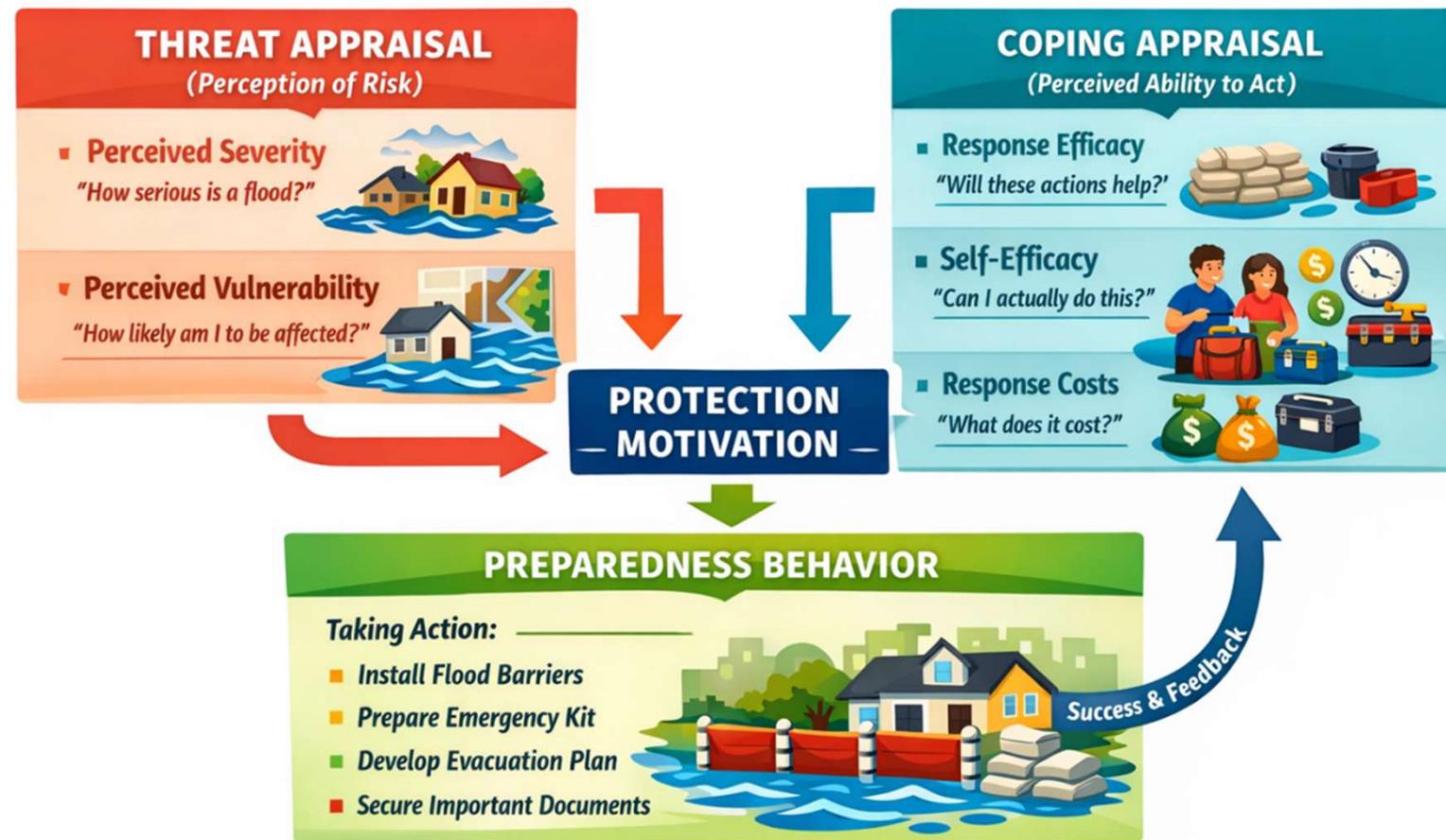
Behavioural insights: Protection Motivation Theory

How Households Decide to Prepare for Floods:



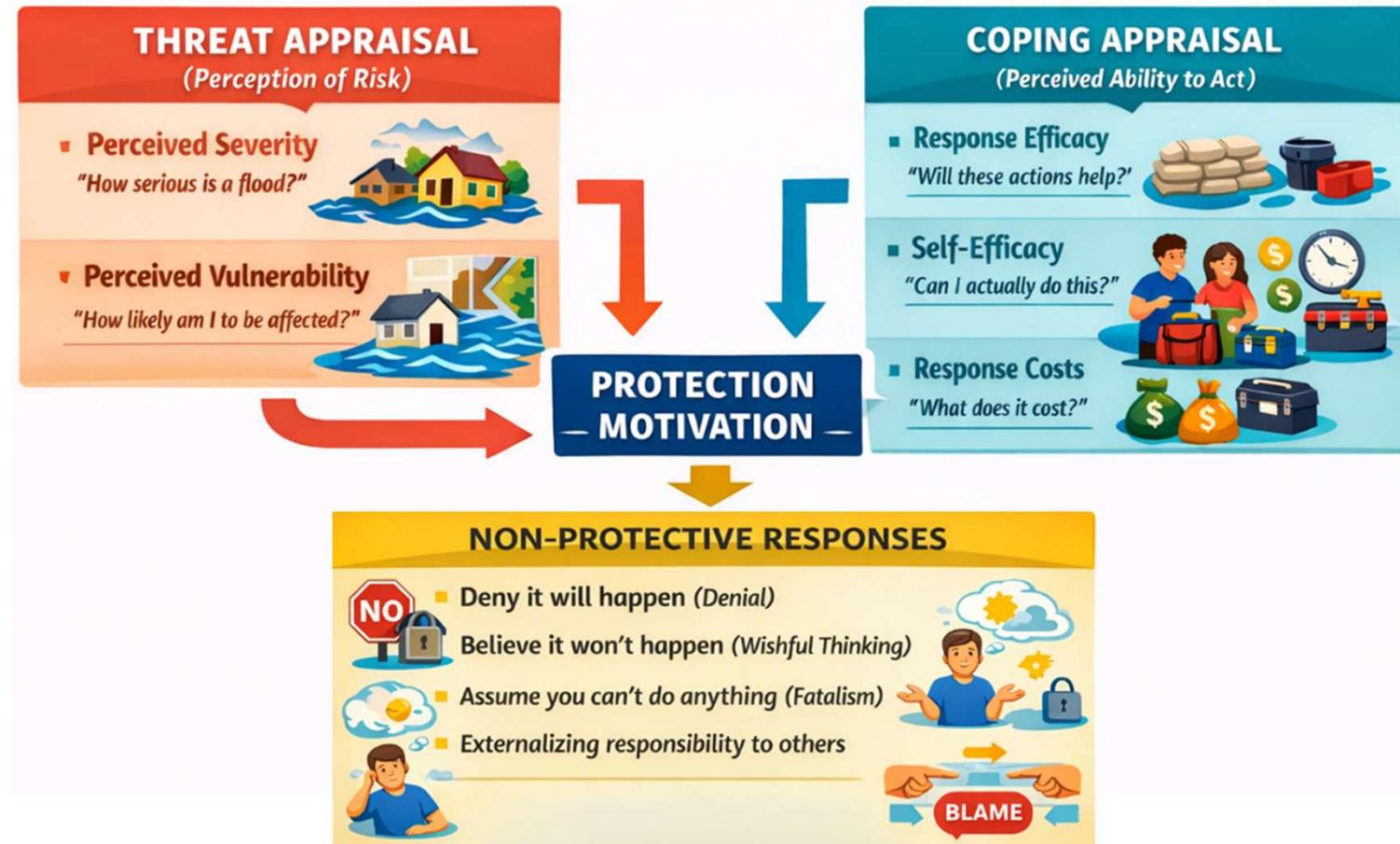
- People take action to protect themselves and their household when they believe (*perceive*) they are at risk.
- Stronger flood risk perceptions increase *intention* to act but this does not automatically translate into action.
- We make decisions depending on our interpretation of the risk, and our emotions influence this process.
- We also reflect upon our ability to cope, including:
 - What measures we can use to respond and whether they will work.
 - Whether we can implement them and can cope with the situation.
 - How much the response will cost us in time, money, effort.
- Together, this guides whether we take protective action or not.

How Households Decide to Prepare for Floods:



Protection Motivation Theory in flood risk preparedness

How Households Decide to Prepare for Floods:



Protection Motivation Theory: Non-protective responses

How Households Decide to Prepare for Floods:



Behavioural insights: COM-B

Capability: We need the knowledge and information to show preparedness/adaptation is important.

Opportunity: The physical and social environment needs to provide two resource types to support action:

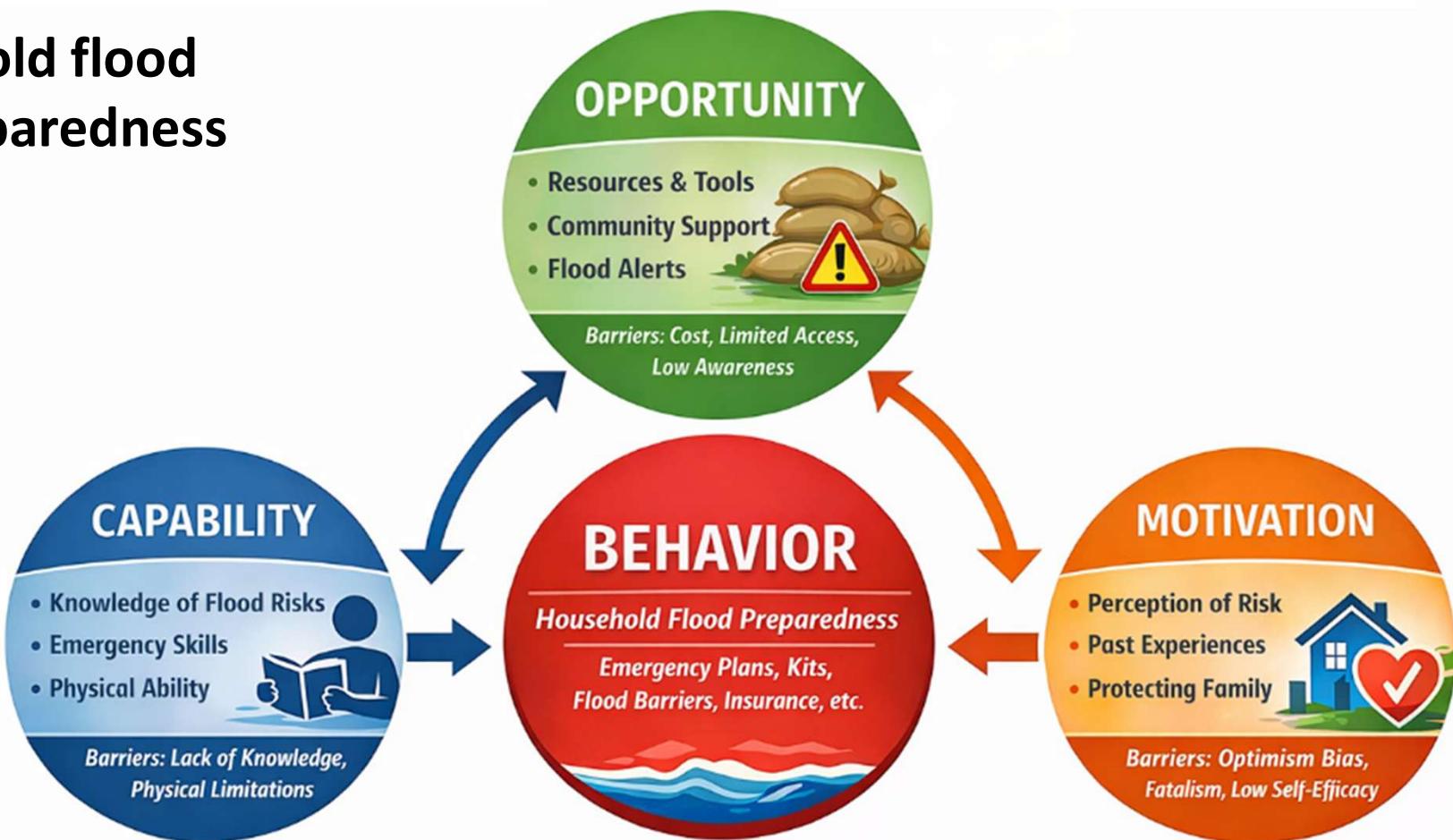
- *Physical* e.g. local infrastructure, innovative products, financial resources etc.
- *Social* e.g. social norms, meaningful social network connections etc.

Motivation: The household must be motivated to prepare, and this might be through:

- *Reflective* motivation i.e. thinking, knowing, perceiving, problem-solving is required to drive future planning activities, conscious intentions and planned behaviour.
- *Automatic* motivation is without deliberate thought i.e. unconscious, fast, and instinctive and includes habits, emotions, impulses and influences behaviour.

COM-B: Household flood risk preparedness

How Households Decide to Prepare for Floods:

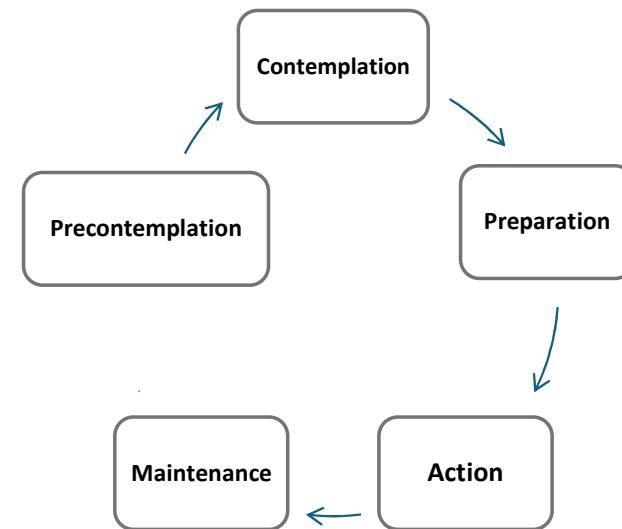




Behavioural insights: Transtheoretical Model

People are not all at the same level of “readiness” to change - 5 key stages:

- *Precontemplation* – Not thinking about changing behaviour or are unaware of their risk.
- *Contemplation* - Aware of risk, thinking about changing their behaviour, no action.
- *Preparation* - Committed to action within a defined time, may have already begun to act.
- *Action* - Actively changing their behaviour.
- *Maintenance* - Still engaged with their flood risk and maintaining their protective actions.



How Households Decide to Prepare for Floods:



Transtheoretical Model: Stages of flood risk preparedness



Precontemplation

'I'm not really actively worried... I don't really know what the risk of flooding in my area is. So, at the moment, I don't feel affected.'

(Female, 24-54, never flooded, Glasgow)

Contemplation

'It makes me want to go and google my flood risk after just having this conversation and thinking about it'

(Male, 25-54, never flooded, E. Dunbartonshire)

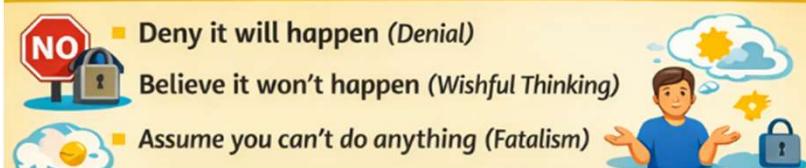
Preparation

"I know that I now have a responsibility as a homeowner to take some safeguards to reduce my risk."

(Male, 25-54, never flooded, Aberdeen)



NON-PROTECTIVE RESPONSES



Behavioural Insights: EAST

To bridge the intention-action gap, applying evidence-led behavioural science approaches like EAST are useful.

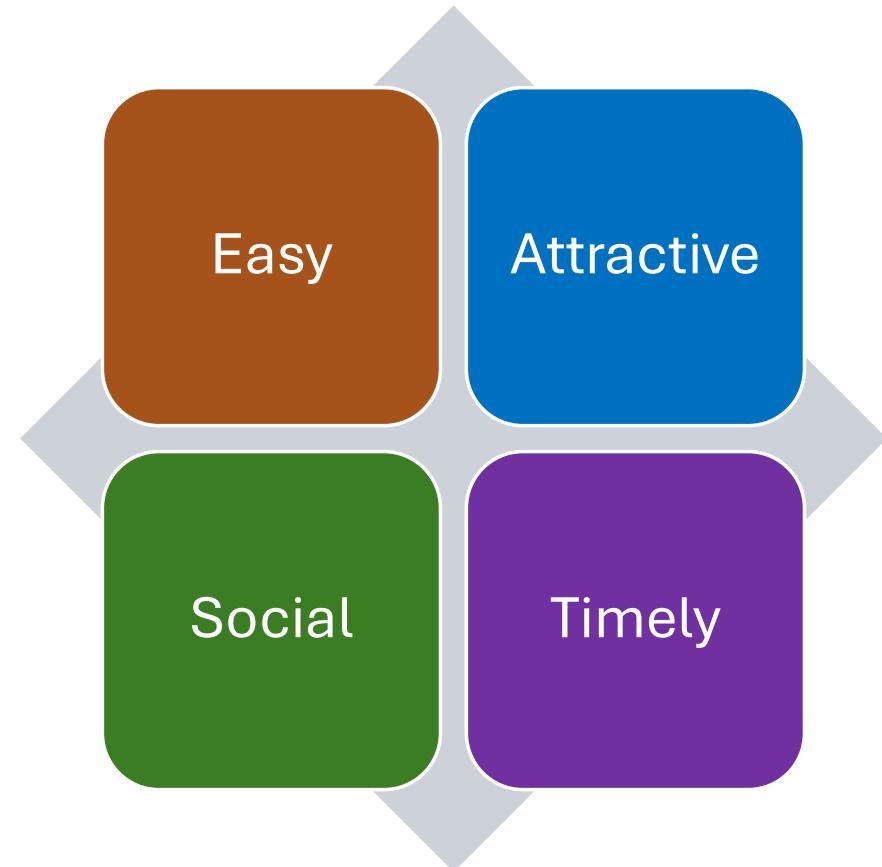
EAST suggests information is:

Easy: Manageable, chunked, as specific as possible, and uses checklists with clear icons.

Attractive: Personalised, place-based, familiar, incentivising.

Social: Encourages discussion and engagement with others, frames action as a partnership, promotes positive social norms.

Timely : Focuses on preparedness ahead of time, prompts future thinking, counteracts memory decay.



Conclusion: What to expect from this household flood plan

[The draft plan]...keeps you calm, makes you think clearly....this kind of helps with the anxiety that I would feel anyway just because you're in an emergency situation...that's how you can spring into action... [it] gives you steps and what to do next.'

(Female, 24-54, never flooded, Glasgow)

- The household flood plan is a low-cost resource people can personalise for their needs.
- It will have some scope for local editability to enable community and public sector organisations to make it relevant to the local area.
- It may also be useful for generating conversations locally, according to some of our community flood action group participants.
- It might reduce anxiety and stress amongst some people who know or discover they are at risk.

Reducing the Mental Health and Wellbeing Impacts of Flooding

Rhian Thomas

University of Glasgow

Reducing the Mental Health and Wellbeing Impacts of Flooding: Informing Cross-Policy Action in Scotland

Dr Rhian Thomas, Dr Claire Niedzwiedz, Dr Hannah Salamon, Dr Thomas Rochow, Chiara Hill-Harding, Dr Mhairi Campbell: University of Glasgow

Dr Fiona Henderson: Glasgow Caledonian University



WORLD
CHANGING
GLASGOW



Flood Resilience Conference 2026

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THE TIMES
THE SUNDAY TIMES
GOOD
UNIVERSITY
GUIDE
2024
SCOTTISH
UNIVERSITY
OF THE YEAR



Why should we think about Flooding and Mental Health in Scotland?



- What are the links between flooding and mental health?
- Who is most vulnerable?
- Why should we care about this in Scotland?
- What can Scotland do?



Increased Risk of Flooding and Coastal Change

(Adaptation Scotland, 2025)

- High river flow runoff has increased by over 20% and winter river runoff by nearly 45% over the last 4 decades (Hannaford, 2015)
- Under a high emission scenario peak river flows for some Scottish river catchments could increase by more than 50% by the 2080's (Kay et al., 2020)
- Projected increases in intense heavy rainfall events in summer and winter will increase the risk of extensive and significant river and surface water flooding
- Recent modest increases in mean sea level have resulted in more frequent flood events (Ball et al., 2008)
- Sea level rise is a key factor in increasing coastal erosion identified across Scotland's soft, erodible shores (Dynamic Coast)



SEPA's National Flood Risk Assessment (2025)

1 in 8 properties (~400,000 properties)



Flooding is Scotland's most severe climate-related risk



Climate change is increasingly having stronger and longer-lasting impacts on people, which can directly and indirectly affect their **mental health and psychosocial well-being** (WHO, 2022)

Climate change has already negatively impacted mental health globally and is expected to worsen with future climate change
(6th Assessment Report IPCC)

Mental Health Impacts of Flooding

- Anxiety and stress-related disorders
- Mood disorders including depression
- Post-traumatic stress disorder (PTSD)
- Strained social relationships
- Sleep disturbances
- Helplessness
- Fear and grief
- Violence and conflicts
- Suicidal thoughts and behaviours
- Alcohol and substance use
- Increase in psychotropic medication use
- Decrease in sense of self and identity via loss of place and grief reactions
- Emerging concepts such as ecological grief, eco-anxiety, solastalgia
- Exacerbation of pre-existing mental disorders

Impacts can be:

- **Direct**
- **Indirect**
- **Psychosocial**

Mental Health and Flooding in the UK

- Greatest health impacts of flooding in UK are on mental health: people who experience flooding are at higher risk (~ X 6) of depression, anxiety and PTSD compared to those unaffected by flooding (HECC, 2023)
- The greater the depth and duration of the floodwater, the greater the risk of poor mental health outcomes



Climate change and mental health: thematic assessment report



10/2023, 11:38 Flooding and health: assessment and management of public mental health - GOV.UK

GOV.UK

Home > Flooding and public mental health: assessment and management

UK Health Security Agency

Guidance
Flooding and health: assessment and management of public mental health

Published 1 July 2022

Contents

- Executive summary
- Introduction and background
- Factors associated with symptoms of mental health disorders
- Interventions to reduce the mental health impacts of flooding
- Flood preparedness and vulnerable people
- Flood protection measures
- Responding to a flood: a phased approach to care
- Case study
- Suggested next steps: public agencies and LAs
- Appendix 1. The English National Cohort Study of Flooding and Health
- Appendix 2. Additional resources
- Appendix 3: Advice for those affected by flooding
- Appendix 4: A wellbeing approach to flood recovery

<https://www.gov.uk/government/publications/flooding-and-public-mental-health-assessment-and-management/flooding-and-health-assessment-a...> 1/39

The English National Study for Flooding and Health: First year report

Briefing for policy makers and practitioners

Health Effects of Climate Change (HECC) in the UK

State of the evidence 2023





Climate change affects everyone – but not equally

Certain groups are disproportionately at risk from climate change-related hazards:

Health	Socioeconomic	Demographic	Geographic	Sociopolitical	Occupational
Chronic diseases	Poverty, financial insecurity	Age (elderly, children, adolescents)	Remote and dispersed communities	Gender	Healthcare and frontline workers
Physical, sensory or cognitive disabilities	Precarious housing; transient communities	Sex	Water-stressed zones; areas prone to extreme weather events	Political instability	Place-based occupations
Pre-existing mental health conditions	Individuals exposed to abuse/violence	Ethnicity	Conflict zones	Displaced populations; migrants	Migrant workers; informal insecure work
Complex healthcare needs at home	Lack of education, poor literacy; language & cultural vulnerabilities	Indigenous status	Declining urban cities	Discriminated or socially-isolated groups	Self-employed



Mental Health and Flooding in Scotland

More Vulnerable in Scotland:

- Children
- Older people
- Those living alone or with pre-existing chronic & mental illness and disability
- Stressful life circumstances
- Place-based occupations
- Low incomes
- Rural & remote areas

(e.g. Werritty, 2007; Brisley et al., 2012 Philip et al., 2020)

Particular vulnerabilities for Scotland:

- Scotland's population is ageing
- Scotland has areas of greater deprivation than rest of UK
- Health is poorest in the most deprived areas of Scotland
- 98% of land mass is rural

(SPICe)



**Secondary
stressors can
have even
greater mental
health impacts
than the
original flood
event**

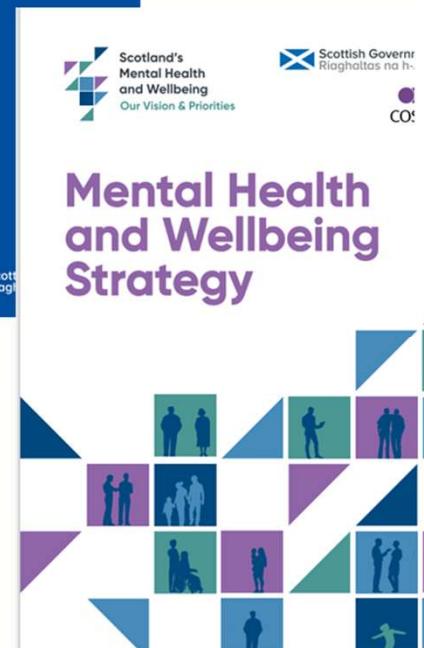
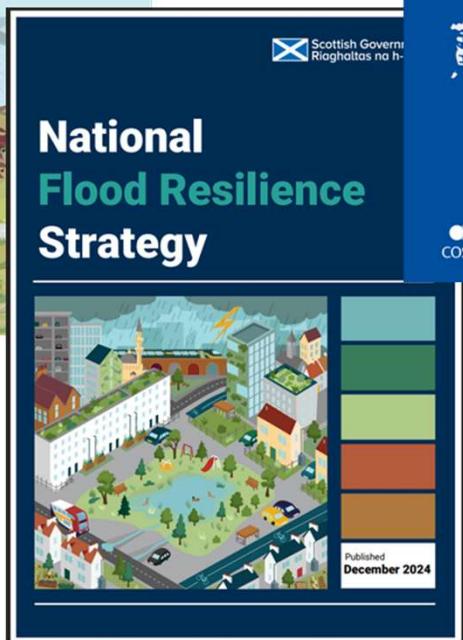
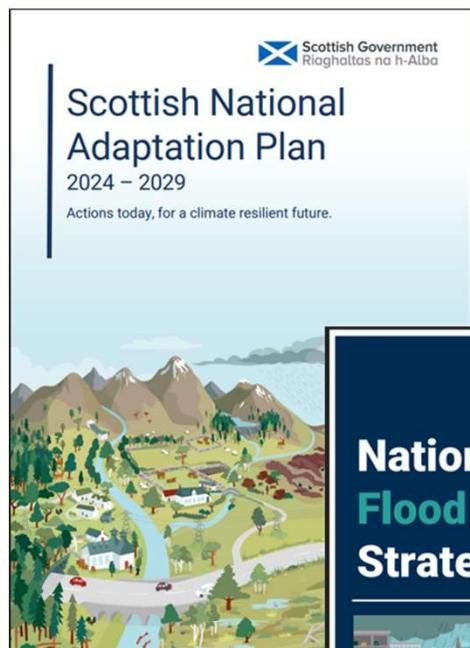
Secondary stressors:

- Lack of flood warning – or not enough time to respond
- Flood water depth and duration
- Extent of flood damage
- Structural damage and costs of rebuilding/repair
- Upheaval and financial implications of cleaning up
- Distress and financial implications of displacement/evacuation from home (temporary or permanent)
- Loss of and damage to possessions and burden on household costs
- Insurance-related issues e.g. dealing with insurance claims
- Disrupted access to employment, education, and wider facilities
- Disrupted access to health and social care services
- Damage to agriculture or livestock, leading



University
of Glasgow

What can Scotland do? : Scotland's Response



Protecting the population from the negative health and wellbeing impacts of adverse weather: Public Health Scotland plan 2024-2027

Publication date: 22 July 2024



National Planning Framework 4

PHS Adverse Weather and Health Plan V1.0



Scottish Government
Riaghaltas na h-Alba



Previous Research

Aimed to **support the development of Scotland's Flood Resilience Strategy** by synthesising existing literature and policies, identifying knowledge gaps, and providing future perspectives and recommendations to enhance individual and community health resilience to fluvial flooding.

CREW CENTRE OF EXPERTISE FOR WATERS

Building Public Health Resilience to Fluvial Flooding in Scotland



Policy Brief
Dr Rhian Thomas and Dr Claire Niedzwiedz

 University of Glasgow

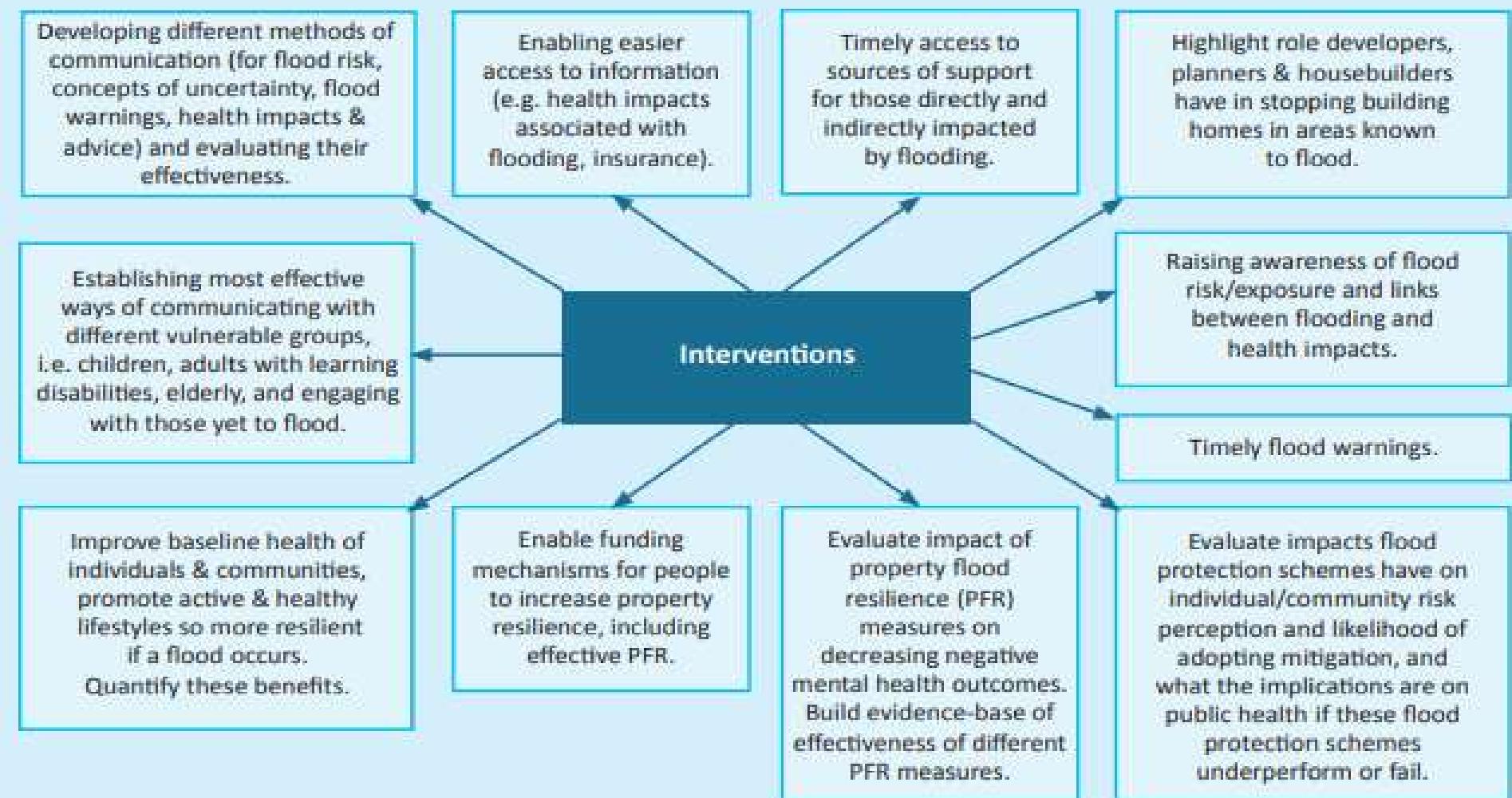
 Scottish Government gov.scot

Key Findings:

- Useful FRM strategies exist however most do not incorporate a public health perspective and have not been co-produced with public health experts
- Need to focus on health resilience measures alongside existing resilience measures
- Need to raise awareness of public health impacts of flooding
- Incorporate pre-existing vulnerabilities of individuals/communities in risk/resilience assessments
- Public health policies recognise flooding has a significant impact on health, particularly mental health, and on disadvantaged groups
- Need for further evidence and guidance for vulnerable groups (e.g. children, disabilities)
- Need for research on effective interventions

Thomas, R. and Niedzwiedz, C. (2024) *Building Public Health Resilience to Fluvial Flooding in Scotland Policy Brief*. CSPF2023_01. Centre of Expertise for Waters (CREW).

Box 8: Research required on the effectiveness of public health interventions for flooding



Research Recommendations & Conclusions

- Need for further research of public health impacts of flooding in Scotland and implement into localised FEM
- Increase cross-sectoral collaborations between public health and environment experts: integrate climate change and health policies
- Greater emphasis on preparedness measures and establishment of long-term community-based support networks
- Need for evaluations of effectiveness of different intervention strategies
- Raise public awareness of physical and mental health impacts of climate change, particularly flooding
- Conduct research into behavioural contexts underpinning individual risk and barriers to behavioural change/ uptake of interventions

Visual minutes from stakeholder workshop Feb 2024. Graphic artist: Jenny Capon





Follow-on Ongoing Research Projects:



CENTRE OF
EXPERTISE
FOR WATERS

Capacity Building Project
Call for proposals 2025

****Household flood plans in Scotland – applying behavioural learnings to inform best practice and uptake****



transform



CENTRE OF
EXPERTISE
FOR WATERS

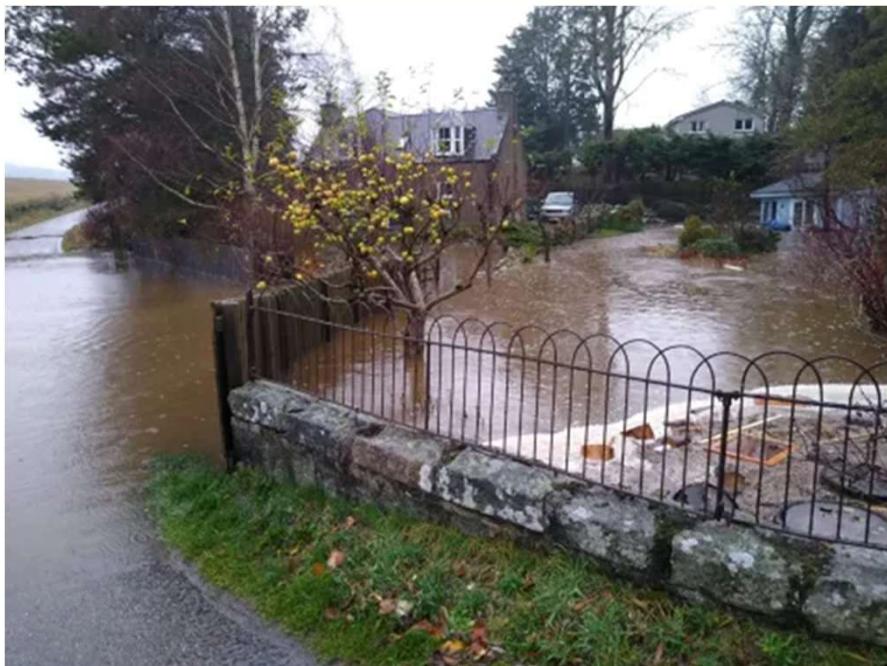
Capacity Building Project
Call for proposals 2025

****Reducing the mental health and wellbeing impacts of flooding:
Informing cross-policy action in Scotland****



transform

Reducing the Mental Health and Wellbeing Impacts of Flooding: Informing Cross-Policy Action in Scotland



Dr Rhian Thomas, Dr Claire Niedzwiedz, Dr Mhairi Campbell, Dr Hannah Salamon, Dr Thomas Rochow, Chiara Hill-Harding: University of Glasgow

Dr Fiona Henderson: Glasgow Caledonian University



Project Steering Group:

CREW CENTRE OF EXPERTISE FOR WATERS



Public Health
Scotland

Scottish Government
Riaghaltas na h-Alba





Project Aim: To develop a detailed understanding of effective cross-policy actions that could be implemented in Scotland to mitigate the negative mental health and broader wellbeing impacts of all types of flooding, including coastal change

Q1. What interventions, including socio-economic, health, property, nature-based and community, could help mitigate the direct negative mental health and broader wellbeing impacts of flooding (of all types, including that related to coastal change)?

Q2. To what extent are these interventions applicable, relevant and effective in the Scottish context for different individuals or groups—particularly those at risk of poorer mental health outcomes and flooding?

Q3. What cross-policy actions are being implemented in countries with similar geographic and socio-economic characteristics to Scotland to mitigate the impacts of flooding on mental health and wellbeing?

Q4. How could different policy areas in Scotland connect and work together to address impacts of flooding on mental health and wellbeing?





Methodology

Project is ongoing

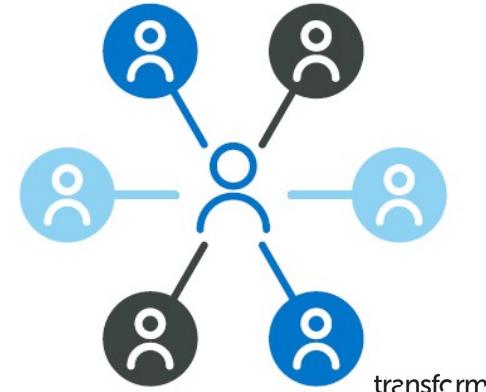
Completion Date: 31st March 2026

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Q4. How could different policy areas in Scotland connect and work together to address impacts of flooding on mental health and wellbeing?



Q1 & Q2 addressed via
a Systematic Review

Q3 & Q4
addressed via
Policy Review
and Policy
Mapping



Examples of Interventions

Structural & Environmental Interventions

Flood risk measures designed to deliver psychological as well as physical protection.



Denmark

Examples

- Multi-functional flood defences (parks)
- Property-level flood protection combined with wellbeing advice
- Natural flood management that enhances sense of place

Mental health pathways

- Reduced fear and uncertainty
- Increased perceived safety and control
- Everyday stress reduction via green/blue space

Policies linked

Flood risk management • Planning • Green infrastructure • Public health



e.g. Household Flood Plan

Examples of Interventions

Preparedness & Risk Communication Interventions

Flood preparedness approaches that reduce anticipatory stress

Examples

- Clear, consistent flood risk communication
- Early warning systems combined with psychosocial guidance
- Training responders to recognise mental distress

Mental health pathways

- Reduced panic and uncertainty
- Increased confidence in response systems
- Faster recovery after events

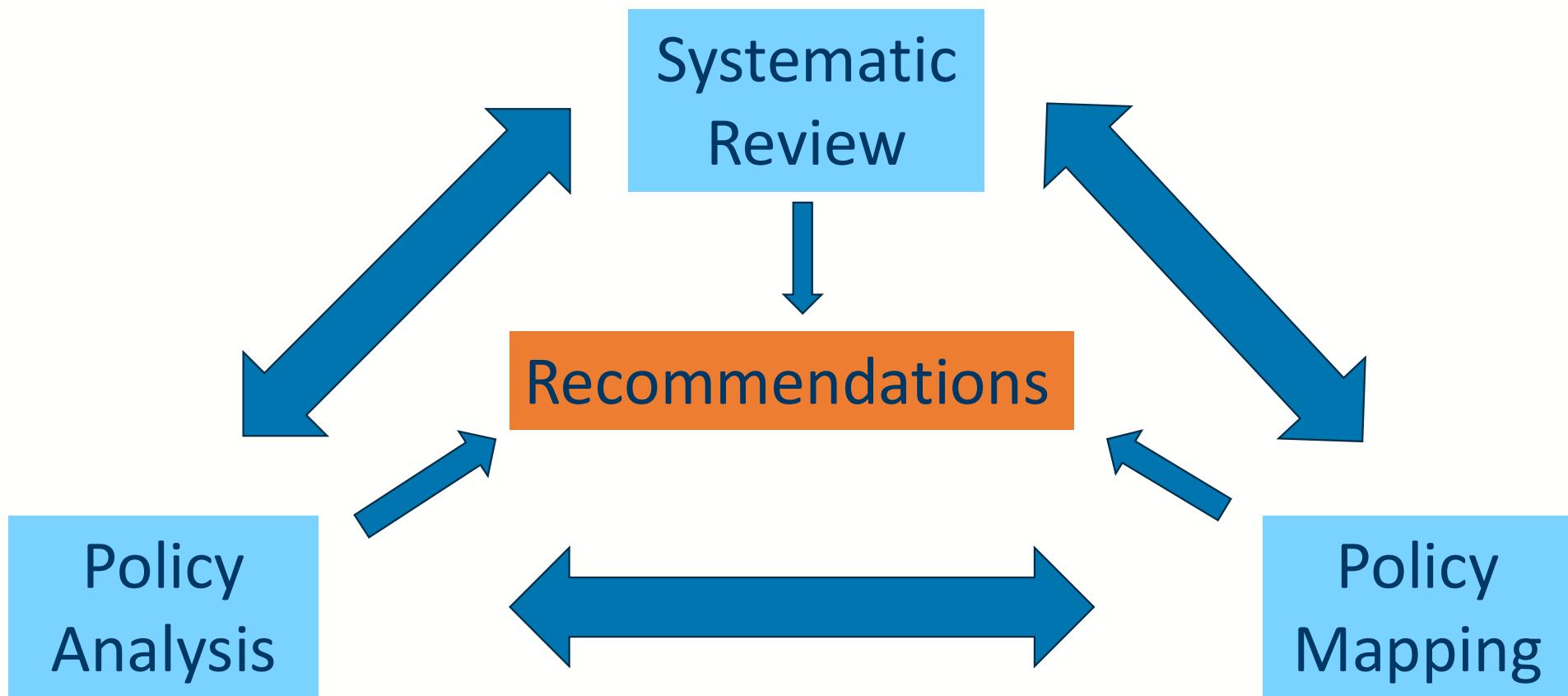
Policies linked

Emergency planning • Public health • Communications • Resilience



Research Outputs: Report

Project is ongoing
Completion Date: 31st March 2026



Thank you for listening

Thanks to:

- CREW

- Project Steering Group: Scottish Government; Scottish Flood Forum; Public Health Scotland; SEPA
- Verture for opportunity to present

#UofGWorldChangers
   @UofGlasgow



Plenary Discussion

Q&A



venture



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Refreshments, Market Place and Networking

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Maximising Participation: Removing barriers to engagement, participation and consultation with diverse communities

Parallel Session E

Marianne Scobie and Karen Wylie
Glasgow Disability Alliance



Glasgow Disability Alliance
Promoting Equality, Rights and Social Justice

Hard to Reach or Easy to Ignore?

Best practice in engaging and involving disabled people.

Marianne Scobie, Depute CEO, GDA

Karen Wylie, Learning Manager, GDA



Glasgow Disability Alliance
Promoting Equality, Rights and Social Justice

Hard to Reach or Easy to Ignore?

Final slides to be updated soon

Marianne Scobie, Depute CEO, GDA

Karen Wylie, Learning Manager, GDA

venture



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Lunch, Market Place and Networking

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Floody Heck – simulating the decision making process of stakeholders in Scotland

Parallel Session F: Andrew Tabas
Heriot Watt University

venture

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**Floody Heck - for more information,
contact Andrew at:
dt2001@hw.ac.uk**

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New climate scenario tools for assessing impacts on infrastructure

Parallel session G: David Harkin and Chris White
Network Rail and University of Strathclyde

Healthy, Resilient and Equitable Places: Place-Based Health Evaluation Using the Spanish Place Standard Tool After an Extreme Climate Event

Parallel Session H: Ana Ocaña, Paloma Almozano,
Benedetta Prisciano

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Flood Resilience Conference 2026

Healthy, Resilient and Equitable Places

Place-Based Health Evaluation Using the Spanish Place Standard Tool After an Extreme Climate Event

Ana Ocaña

Paloma Altozano

Benedetta Prisciano



GENERALITAT
VALENCIANA



Fundació
Fisabio



JA Prevent NCD

Joint Action Prevent Non-Communicable Diseases

Presentation overview

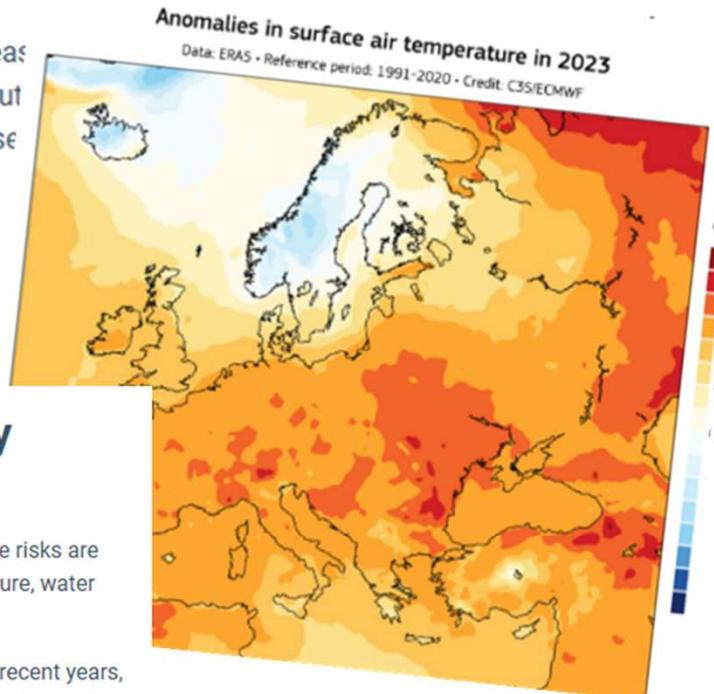
- 1. National Policy and Strategic Framework on Climate Change in Spain**
- 2. Understanding the Territory**
- 3. The DANA Event**
- 4. Study Context**
- 5. Implementation Process and Results**
- 6. Conclusions**

1. National Policy and Strategic Framework on Climate Change in Spain

How are extreme weather events influencing adaptation policies?

Climate risk assessments that take account of threats like heatwaves, droughts, floods and wildfires are increasingly being used to inform and improve national adaptation policies.

Heatwaves, droughts, floods and increasing **weather events** reported by national authorities reported that they expected an increase in extreme events.



Europe is not prepared for rapidly growing climate risks

Europe is the **fastest warming continent** in the world, and climate risks are threatening its energy and food security, ecosystems, infrastructure, water resources, financial stability, and people's health.

Extreme heat, drought, wildfires, and flooding, as experienced in recent years, will worsen in Europe even under optimistic global warming scenarios and affect living conditions throughout the continent. The EEA has published the first ever **European Climate Risk Assessment (EUCRA)** to help identify policy priorities for climate change adaptation and for climate-sensitive sectors.

THE IMPACT OF CLIMATE CHANGE ON EUROPE

Arctic	Boreal region	Mountain areas
Temperature increases much more than the global average Less ice covers the Arctic sea Less ice covers Greenland Fewer permafrost areas Higher risk of biodiversity loss	More heavy rain Less snow and ice More rain and river flows Forests grow faster and more risk of forest pests Winter storms become more damaging	Temperature increases more than the European average Fewer and smaller glaciers Plants and animals will move to a higher altitude High risk of species extinction Higher risk of forest pests Higher risk of rock falls and landslides Hydropower could be affected
Some new opportunities for exploiting natural resources and transporting by sea	Higher crop yields Less energy needed for heating More opportunities to use hydropower More summer tourism	Risks to the livelihoods of local people
Mediterranean region	Atlantic region	Continental region
More heat extremes Less rain and river flows Higher risk of droughts Higher risk of biodiversity loss Higher risk of forest fires	More competition for water More water needed for agriculture Lower crop yields Livestock production becomes more difficult Producing energy becomes more difficult More energy needed for cooling Less tourism in summer, but possibly more in other seasons Most economic sectors negatively affected Very vulnerable to the spillover effects of climate change outside Europe	More people die because of heat waves More areas where people can catch diseases from insect bites
More weather extremes Less rain in summer Higher risk of river floods Higher risk of forest fires	More heavy rain Higher river flow Higher risk of flooding Higher risk of damage due to storms in winter More bad weather	Higher sea surface temperatures Ocean becomes more acidic Marine species migrate north Changes in phytoplankton communities More marine dead zones
Less energy needed for heating	Forests become less valuable More energy needed for cooling	Risks and some opportunities for fisheries Higher risk of water-borne diseases
Coastal regions and seas		
Higher sea surface temperatures Ocean becomes more acidic Marine species migrate north Changes in phytoplankton communities More marine dead zones		
Risks and some opportunities for fisheries Higher risk of water-borne diseases		



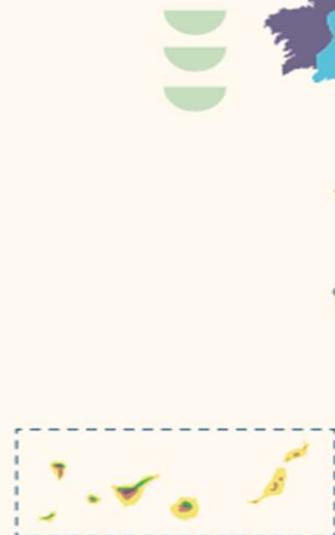
Spain: **49,077,984 inhabitants (2025)**



Valencian Community: **5,425,182 inhabitants(2025)**

This is how our climate is

The area for which the climate is defined can vary from a few square kilometres to larger territories (the most common case) where geographical and meteorological characteristics are more or less common.



OCEANIC



TEMPERATE MEDITERRANEAN



MOUNTAIN

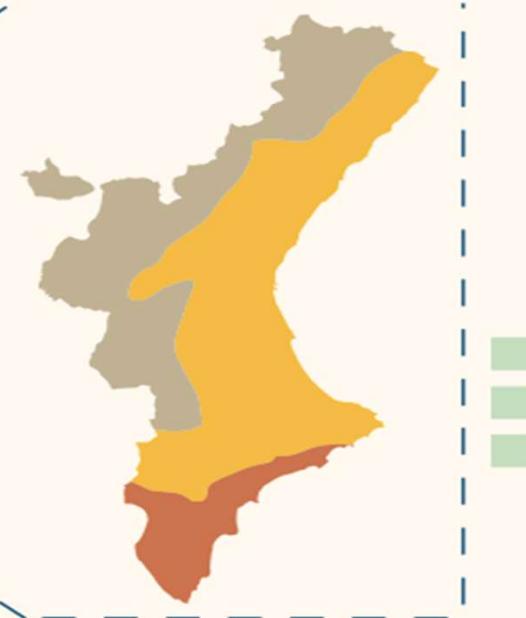


SUBTROPICAL CANARY ISLANDS



Source: National Geographic Institute

Spain is located at the temperate zone of the Planet and has four climatic zones: Oceanic, Mediterranean, Mountainous and Subtropical. The Mediterranean climate is the one that occupies the largest area.



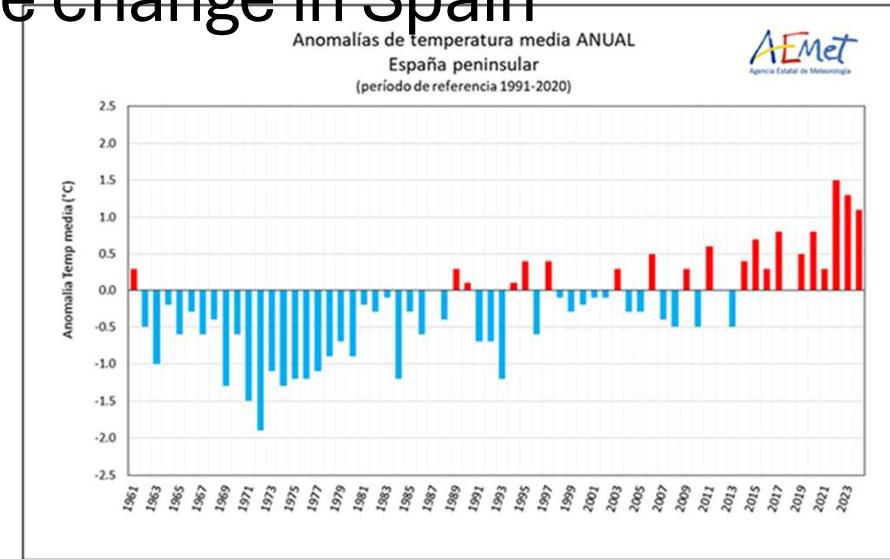
The climate of the Valencian Community presents certain contrasts related to altitude and the layout of the relief.

The coastal strip has a Mediterranean coastal climate, which could be called a typical Mediterranean climate.

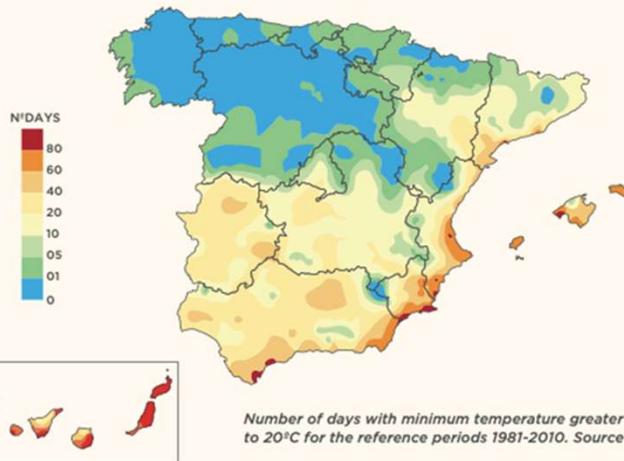
In the south of the province of Alicante there is a sub-desert Mediterranean climate, while in pre-coastal areas and mountainous areas the climate is continental.

The consequences of climate change in Spain

- Increased droughts and wildfires
- Water scarcity and aquifer salinization
- More extreme weather events (floods and **DANAs**)
- Loss of biodiversity and ecosystem degradation
- Desertification risk
- Sea-level rise and coastal erosion



INCREASE IN THE NUMBER OF TROPICAL NIGHTS

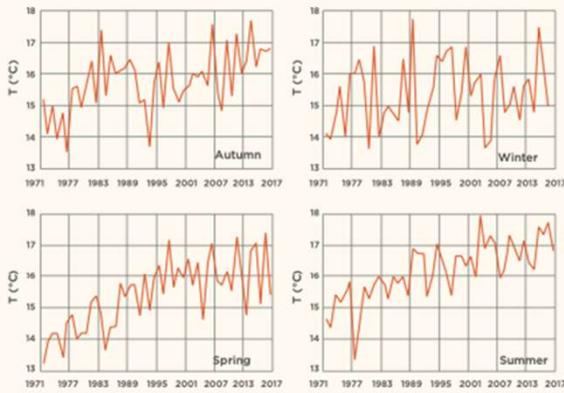


The Mediterranean coast is an area particularly vulnerable to climate change. The increasingly warmer Mediterranean is having an impact on its coastal regions, increasing the number of tropical nights, defined as those in which the minimum temperature is equal to or higher than 20°C.

In the Mediterranean region, the area with more than 60 tropical nights (especially in the eastern region and the Balearic archipelago) is expanding significantly.

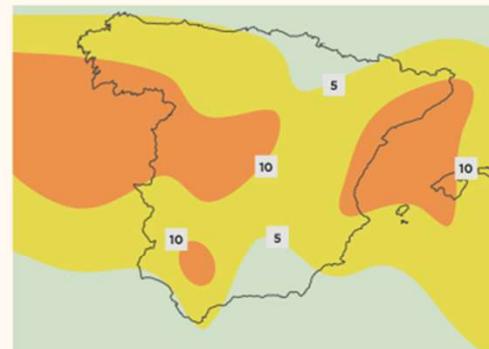
LONGER SUMMERS

AVERAGE SEASONAL TEMPERATURE



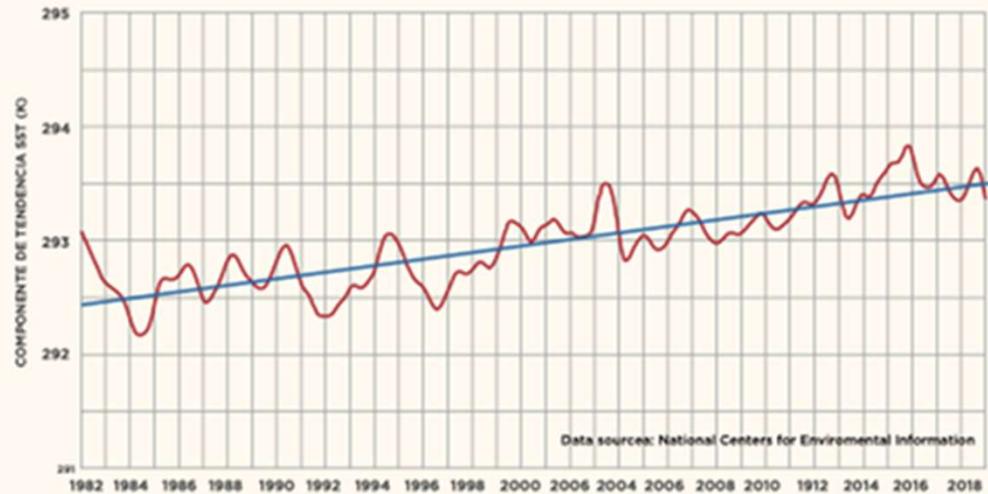
Average temperatures are getting higher every year, the rise is most noticeable in spring and, above all, in summer. Summer is the season most affected by climate change.

DAYS OF SUMMER LENGTHENING UNDER TEMPERATURE CRITERIA

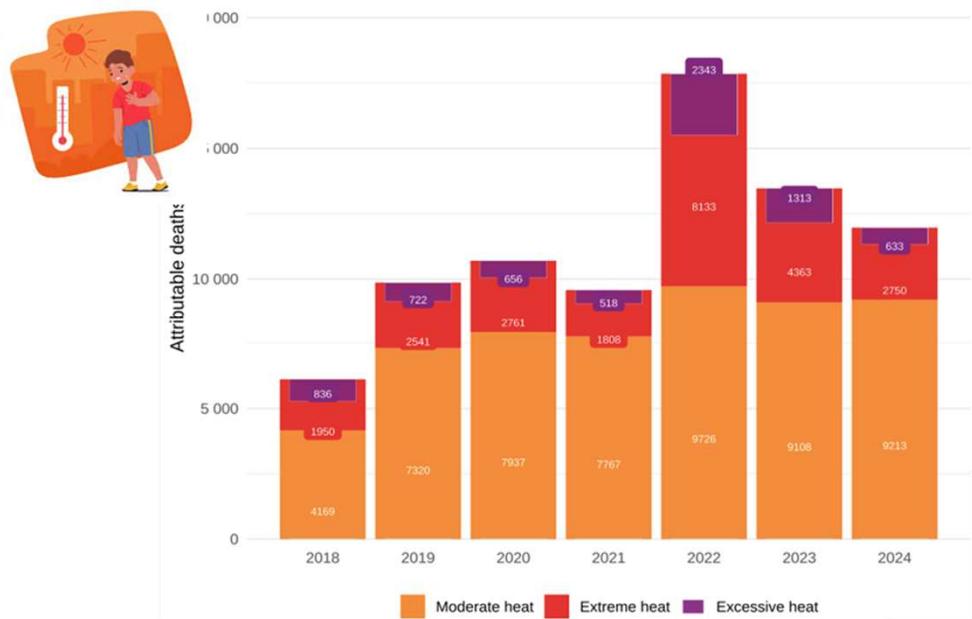


Summer is lengthening by an average of 9 days per decade, 5 weeks longer than in the early 1980s.

DAILY EVOLUTION OF THE MEDITERRANEAN SURFACE TEMPERATURE



Heat-attributable mortality in summer



Climate policies

Spain



Legal Framework

Law 7/2021, on Climate Change and Energy Transition.

Mitigation

National Integrated Energy and Climate Plan (PNIEC).



Adaptation

National Climate Change Adaptation Plan (PNACC).

Valencian community



Law 6/2022, of 5 December, on Climate Change and the Ecological Transition of the Valencian Community



Climate policies - strategies

Spain

Legal Framework

Law 7/2021, on Climate Change and Energy Transition.

Mitigation

National Integrated Energy and Climate Plan (PNIEC).

Adaptation

National Climate Change Adaptation Plan (PNACC).



- Binding objective of climate neutrality
- Reduction of greenhouse gas emissions
- Mainstreaming climate adaptation across all public policies
- Sustainable water management
- Protection of public health from extreme events
- Ecosystem conservation
- Climate-resilient infrastructure and territories
- Renewable energy expansion
- Energy efficiency improvements
- Electrification of transport
- Phase-out of fossil fuels
- Support for self-consumption and energy storage

Valencian community

Law 6/2022, of 5 December, on Climate Change and the Ecological Transition of the Valencian Community

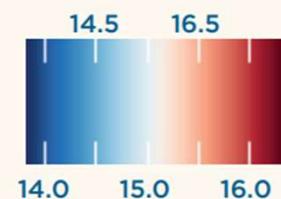
Valencian Integrated Energy and Climate Plan (PVIECC 2030)



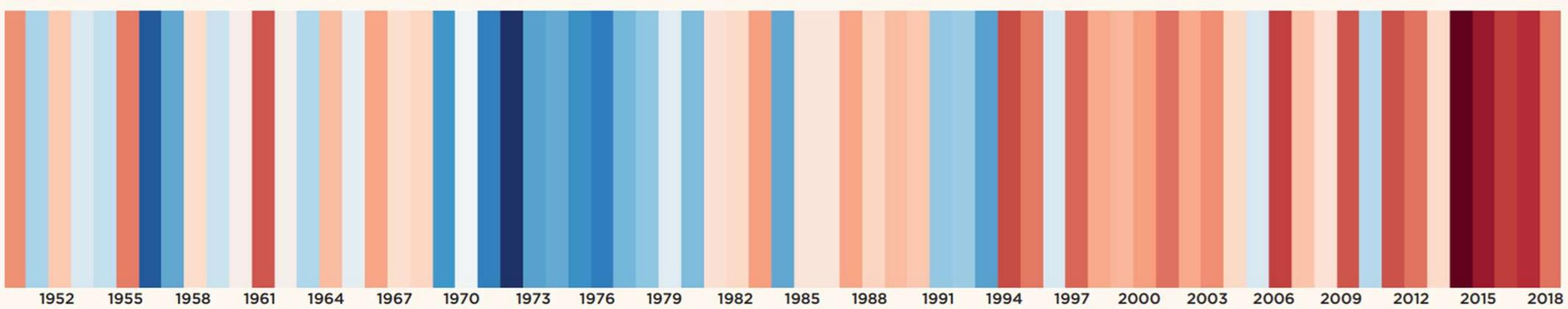
- decarbonization of the economy
- promoting renewable energy deployment,
- improving energy efficiency,
- reducing dependence on fossil fuels across key sectors such as buildings, transport, and industry.
- enhance territorial resilience,
- reduce vulnerability to climate risks such as heatwaves, droughts, and floods,
- protect ecosystems and natural resources

The Hawkins Bar Graph

The Hawkins graph represents chronologically the evolution of the annual temperature, in this case that of the Comunitat Valenciana in the period from 1950 to 2018. In this graph we can see a clear trend towards higher temperatures.

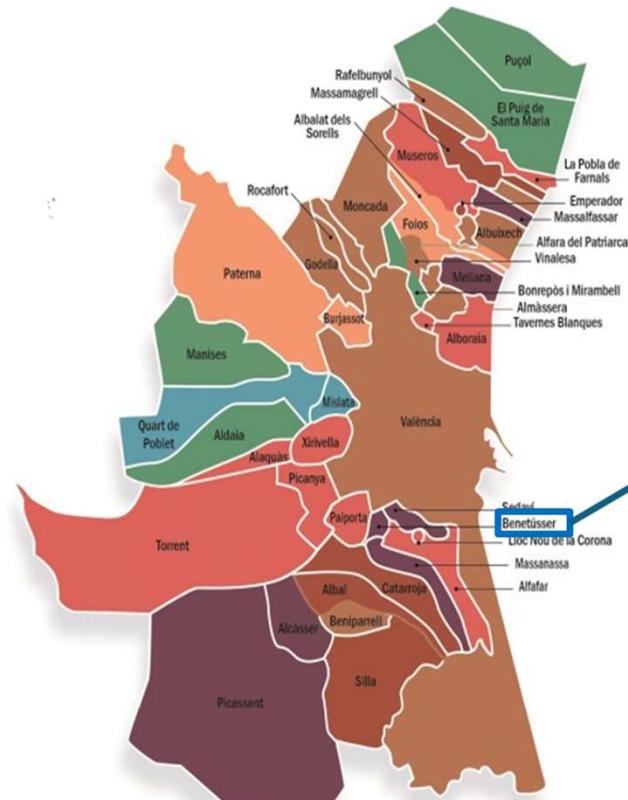


AVERAGE ANNUAL TEMPERATURE IN THE VALENCIAN COMMUNITY 1950-2018

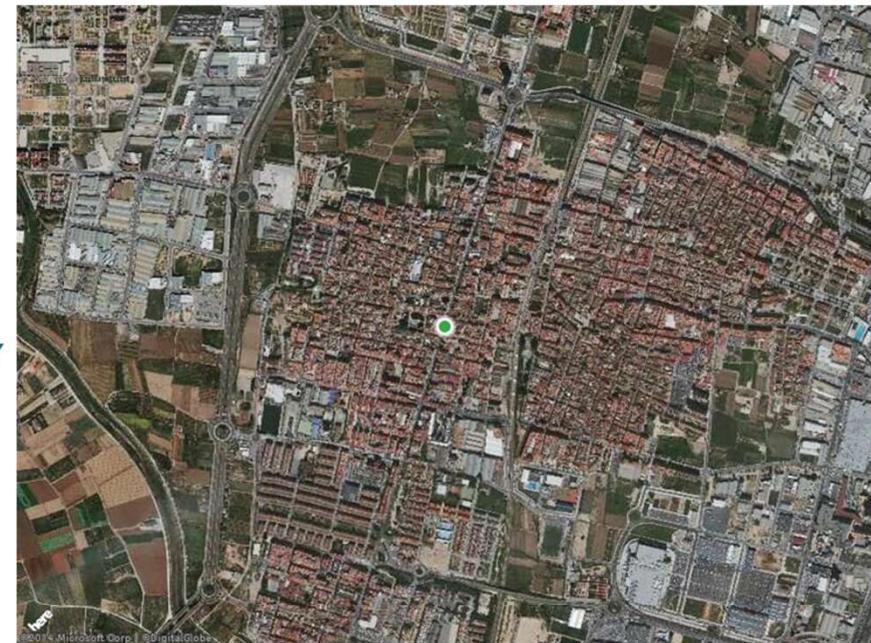


2. Understanding the Territory

Valencian Community – 5.4 million inhabitants



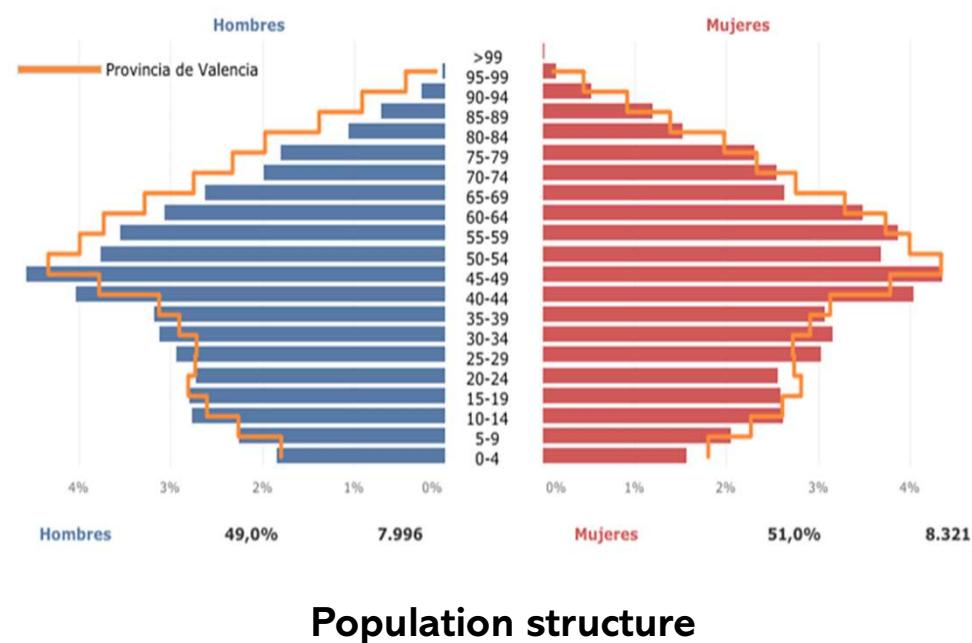
Metropolitan area of Valencia – 1.8 million inhabitants



Benetússer – 16,300 inhabitants

Benetússer: sociodemographic and territorial context

- **Area:** 0.78 km²
- **Population:** 16,317 inhabitants (2024)
- **Foreign population:** ~15%, mainly from Latin America, Eastern Europe, and North Africa.
- **Economy:** shift from agriculture and furniture industry to a service- and commerce-based economy.
- **Income (2022):** €24,392 average annual income
- **Unemployment:** ~13%.
- **Mobility:** Train station, metropolitan Metrobus, and Metrovalencia access via neighbouring municipalities.





Benetússer

3. The DANA Event (Isolated high-level depression)

On **October 24, 2024**, an isolated high-altitude depression (**DANA**) hit this region, bringing heavy rainfall and severe flooding. The event caused significant human and material losses, affecting the lives of many residents and leaving a lasting mark on the community.



<https://www.youtube.com/watch?v=DTa9db7RRbs>

LOCALIDADES AFECTADAS EN LA CIUDAD DE VALENCIA

Desbordamiento de la Rambla del Poyo
a 1,9 km. al sur del desvío del Turia



FUENTE: Elaboración propia.

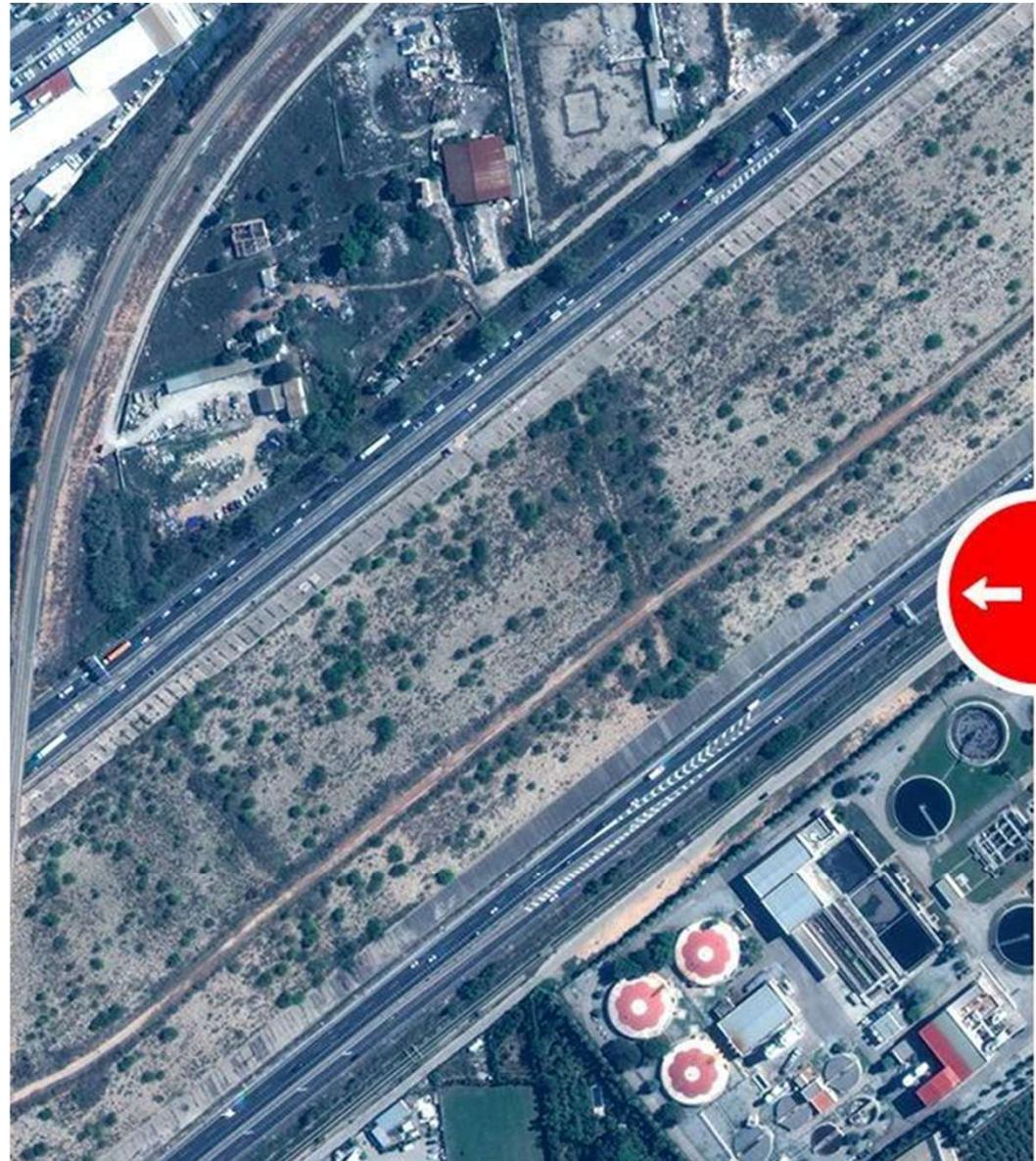
J.C.S. E.A. | EL MUNDO

Zona inundada por las lluvias torrenciales en torno al barranco del Poyo



FUENTE: Elaboración propia | GRÁFICO: Henar de Pedro 20minutos





29/04/24





DANA Damage Assessment

Pre-existing Social and Environmental Vulnerabilities



THE METEOROLOGICAL EVENT

Record rainfall: 772 mm total, with a historic national maximum of 184.8 mm/hour



TERRITORIAL VULNERABILITY

Steep terrain combined with **anthropogenic soil sealing**, accelerating water runoff and increasing flood intensity.



HUMAN RISK

High population density and concentration of businesses in flood-prone areas, resulting in **multiplied risk exposure**.



SYSTEM FAILURE

Underinvestment in hydraulic infrastructure combined with **multiple breakdowns in alert and warning systems**.

DANA Damage Assessment

Impact in numbers



+ 308,000 **people** directly affected
230 deaths
+ 117,000 people received medical care
+ 37,000 people had to be rescued
+ 98,000 elderly people affected



+ 141,000 **damaged vehicles**
85% declared total loss
Hundreds of garages still affected



+2,000 **uninhabitable homes** due to severe structural damage

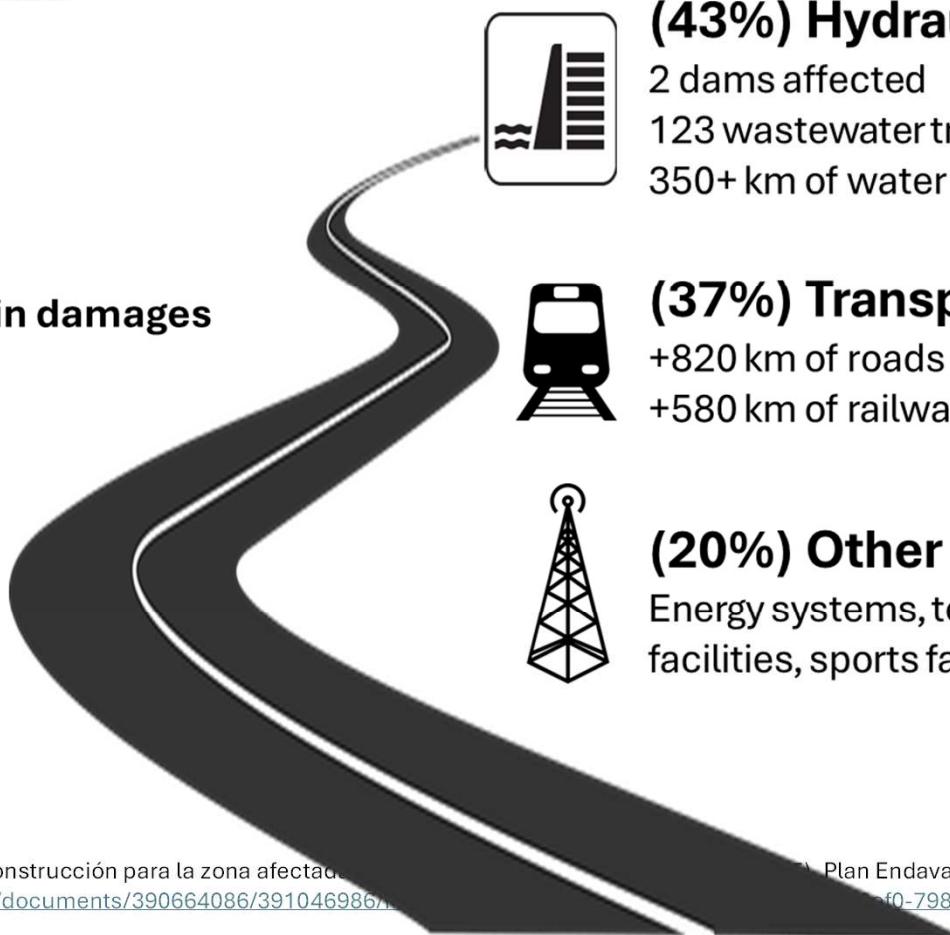


+8,000 **elevators** still out of service

DANA Damage Assessment

Impact in numbers

€1.8 billion in damages



(43%) Hydraulic Infrastructure

2 dams affected
123 wastewater treatment plants affected
350+ km of water channels affected



(37%) Transport

+820 km of roads and bridges affected
+580 km of railways affected



(20%) Other infrastructure Impact

Energy systems, telecommunications, educational facilities, sports facilities, others public facilities.

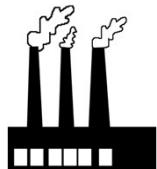
DANA Damage Assessment

Impact in numbers



Macroeconomic

0.6 pp reduction in GDP



Business

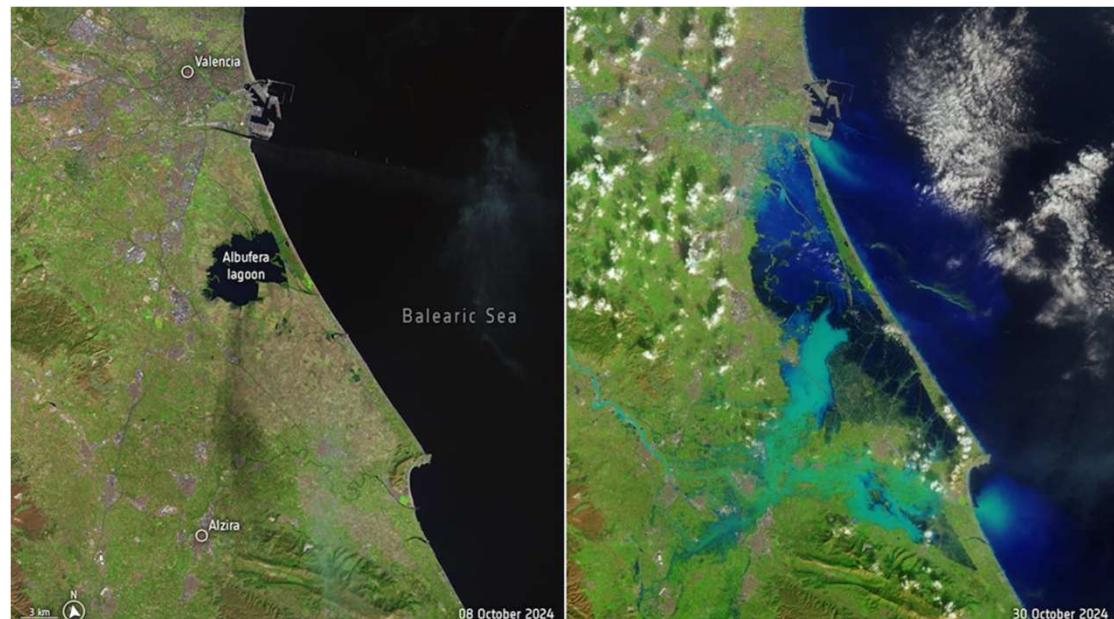
78 industrial Parks affected
€150+ million in asset damage and losses due to inactivity.



Employment

274,883 workers in the affected área.
33165 on temporary layoff.

A Wound in the Territory: 552 km² flooded, causing severe damage to key ecosystems.



Severe damage to natural parks and protected areas

4. Study Context

Study Context

- ✓ Municipality integrated into the **Local Health Action Strategy (XarxaSalut)**
- ✓ **Municipal Health Council** composed of local government, territorial professionals, and citizens (affiliated and non-affiliated)
- ✓ **Health situation analysis** conducted prior to the DANA, using a **social determinants approach**



- ✓ **One year after the DANA**, a participatory health situation analysis was needed
- ✓ Analysis aimed to **integrate all dimensions of the local environment**
- ✓ Designed to **enable community action**

Objectives

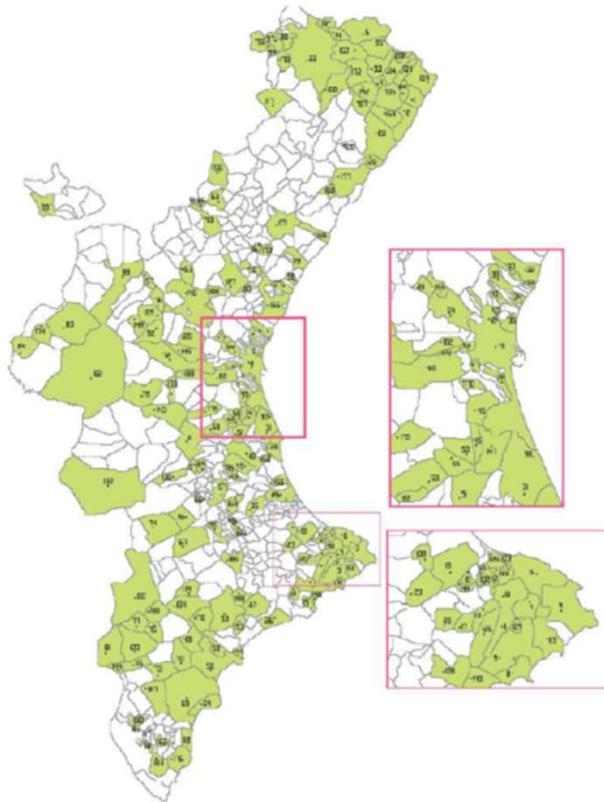
Main:

Assess Benetússer's vulnerability and adaptive capacity to climate change, identifying community problems, needs, assets, and resources to guide local climate action.

Secondary:

- Analyze exposure, vulnerabilities & response capacity
- Prioritize climate & health-related problems
- Identify community assets for adaptation & mitigation
- Promote participatory community engagement
- Inform local policies & strategies

Local Health Action Strategy in the Valencian Community



+350 municipalities ($\pm 80\%$ population)

What is XarxaSalut?

- Network of municipalities in the Valencian Community
- Promotes local health action based on the social determinants of health and equity
- Supports participatory health assessments and community engagement
- Integrates health, equity, and sustainability into local policies
- Aims to reduce health inequalities and improve population well-being

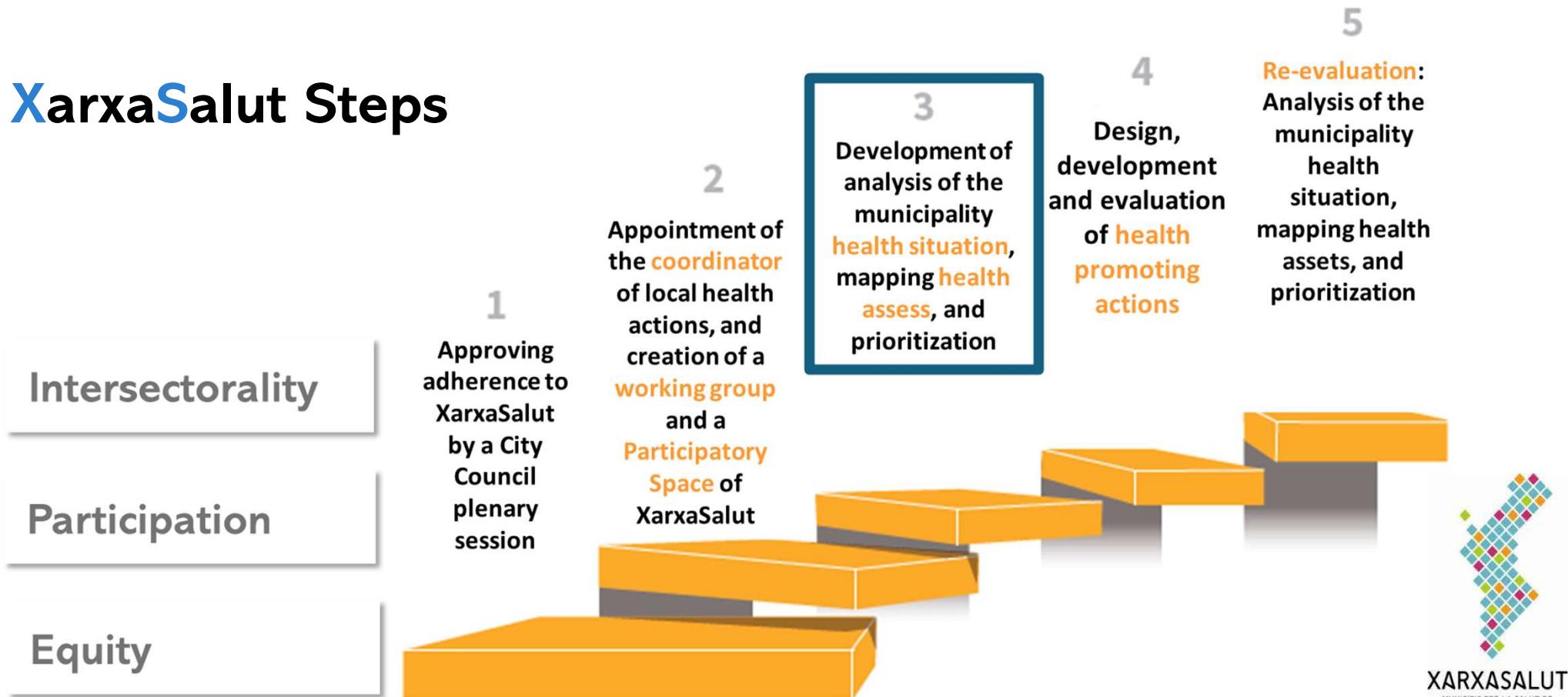
“Municipalities network of the Valencian Community **committed** to develop **health promotion** activities at the local level”



XARXASALUT
MUNICIPIS PER LA SALUT DE
LA COMUNITAT VALENCIANA

Local Health Action Strategy in the Valencian Community

XarxaSalut Steps



Local Health Action Strategy in the Valencian Community

The Place Standard tool is a way of assessing places.

Whether the place is well-established, undergoing change, or is still being planned, the tool can help you.



PST Spanish version (2021)

Participatory Health Assessment



Spanish Climate Lens version (2025)

Climate-Focused Participatory Health Assessment



Entornos de Vida

<https://www.ourplace.scot/tool>

Ocaña Ortiz A, Paredes-Carbonell JJ, Peiró Pérez R, Pérez Sanz E, Gea Caballero V. *Evaluación participativa del territorio con enfoque de equidad: adaptación y validación de la Place Standard al contexto español*. Gac Sanit. 2022;36(4):360-7.
doi:10.1016/j.gaceta.2021.03.006

5. Implementation Process and Results

Implementation Process



Implementation Process



Stakeholder Participation

53 participants took part, including citizens (affiliated and non-affiliated), people with disabilities, local professionals, health center staff, municipal technical personnel, and representatives of the municipal government and Health Council.

01

Situation Analysis with Climate Focus

Block 1: Mobility & Accessibility

Walking and Cycling



Public Transport



Traffic and Parking



Small town environment favors walking, but schedules and extreme weather push people to use cars.

Need for shaded, safe walking routes during hot summers or storms.

Bike lanes and infrastructure are disconnected and underused.

Overcrowded trains and buses; poor connections with nearby towns.

Limited accessibility for people with reduced mobility.

Extreme weather disrupts transport services.

High car density impedes pedestrian mobility.

Lack of peripheral or secure bike parking.

Car-dependent culture: short trips by car, even in good walking conditions.

01

Situation Analysis with Climate Focus

Block 2: Urban and Natural Environment

Streets and Public Spaces



Narrow streets limit green areas; asphalted squares increase heat and reduce social use.

Accessibility issues for wheelchairs; need to identify and remove obstacles.

Natural Spaces



Few or no local green areas; plazas unshaded.

Poor rainwater management and lack of climate refuges.

Interventions often improvised; lack of long-term planning.

Housing and Community



Low energy efficiency; high heating/cooling costs.

Vulnerable to floods, especially ground-floor homes.

Maintenance and Care



Streets poorly maintained post-extreme weather events.

Weak sense of community responsibility; citizens rely heavily on institutions.

01

Situation Analysis with Climate Focus

Block 3: Social & Community Life

Play & Leisure



Youth lack dedicated spaces and activities; most end up in bars or parks.

Sports facilities damaged by extreme events; limited accessibility for people with disabilities.

Few climate-refuge spaces for heatwaves.

Social Contact



Mutual support exists but unorganized; vulnerable people suffered during extreme events.

Need for emergency plans and updated census of vulnerable groups.

Opportunities for shared mobility and collaborative initiatives.

Identity &

Belonging



Climate awareness increased after extreme events.

Migrant populations less involved; need inclusion and participation incentives.

Coherent local measures needed to reinforce community identity.

Influence &

Participation



Low sense of participation in collective plans; people want to contribute but don't know how.

Young people interested but lack channels; municipal leadership required.

01

Situation Analysis with Climate Focus

Block 4: Services & Infrastructure

Facilities & Services



Key services delayed; limited access to administrative and social services, digital barriers exist.

No local food production; need collaboration with neighboring towns.

Insufficient recycling and shared-resource infrastructure; information poorly disseminated.

Work & Local Economy



Lack of green jobs and climate-adaptation employment.

Legal and infrastructure limits reduce municipal action and business resilience.

Local businesses highly vulnerable to extreme events.

Increased fear and insecurity after extreme events.

Need safe mobility, shaded spaces, emergency preparedness, and climate awareness.

Urban planning favors cars; pedestrians, children, older adults, and people with disabilities are exposed.

Safety



02

Validation & Prioritization*

Step 1: Organize

Reorganized all information from the working groups. Grouped issues into **17 key needs** and problems for clarity.

Step 2: Reflect

Collective discussion: "Are we missing anything? Is this correct?"

Ensured all perspectives and overlooked issues were considered.

Step 3: Prioritize

Participatory voting: each participant had 3 votes.

Prioritization based on relevance, impact (number of people affected), and equity.

Identified the most urgent issues to address.



*A participatory prioritization activity was carried out, since the standard scoring and diagram of the Place Standard Tool were not completed.

02

Validation & Prioritization

Top 5 Priority Needs/Problems

1. Insufficient access to clear and timely information on services and emergencies

Current communication channels do not effectively reach the whole population, especially in crisis situations.

2. Limited education and preparedness for climate-related emergencies

Lack of training, guidance and collective readiness for extreme weather events.

3. Shortage of inclusive spaces and activities for young people and diverse groups

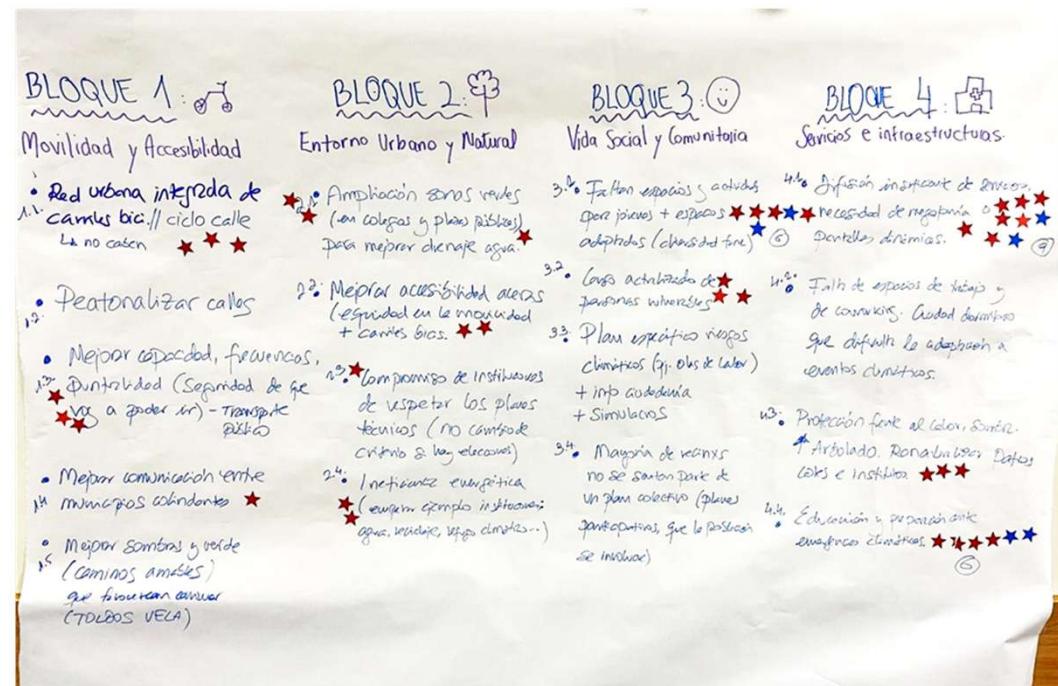
Insufficient infrastructure to support social inclusion, wellbeing and community cohesion.

4. Lack of green areas and permeable surfaces to cope with heat and flooding

Excessive asphalt increases heat stress and flood risk, particularly around schools and public spaces.

5. Inadequate conditions for sustainable and safe mobility

Limited cycling infrastructure and public transport capacity hinder safe, low-carbon mobility.



03 Assets & Resources

Purpose

Identify existing assets and resources linked to the **top-voted needs**.

Focus

What exists · What is missing · What can be activated

Work carried out

Review and grouping of prioritized needs

Mapping of assets and gaps

Identification of action lines and key actors

Outcome

Basis for **thematic working groups** and next steps



03

Assets & Resources

60 Assets and resources identified

Institutional programmes and services: ~15

(e.g. Benetússer Camina, municipal services, emergency systems, health and social care)

Physical infrastructures and spaces: ~20

(public buildings, plazas, schools, refuges, transport infrastructure, public spaces)

Community and associative assets: ~15

(associations, fallas, sports clubs, neighbourhood groups, NGOs)

People: ~10

(municipal technicians, health professionals, emergency services, educators, citizens)

30 Stakeholders and key actors identified

Municipal political leadership and technical departments

Health and social care services

Educational centers and AMPAs

Emergency services and civil protection

Community organizations and NGOs

Youth, elderly and disability representative groups

Intermunicipal and regional bodies

The process generated ~30 action lines addressing over 20 identified problems, tackling climate-related mobility, urban heat, accessibility, energy efficiency, emergency preparedness and community resilience through an integrated, equity-focused approach.

04

Results feedback & Next Steps

1

LOCAL CLIMATE GOVERNANCE & PLAN CONTINUITY

Establish a local climate-health framework, ensure long-term political backing, activate councils, and involve leaders and staff in participation.

5

COMMUNICATION, INFORMATION & ALERT SYSTEMS

Implement community alerts, diversify communication channels, provide accessible info, and improve climate refuge visibility.

2

EDUCATION & CLIMATE EMERGENCY PREP

Develop guides, run drills, use past events as lessons, and involve vulnerable groups in planning.

4

HEAT PROTECTION & URBAN RENATURALIZATION

Increase green spaces, shade, and climate shelters; add cooling elements; apply climate comfort in all urban interventions.

3

HEALTHY, ACCESSIBLE & RESILIENT MOBILITY

Create continuous bike/walk networks, improve safety and shade, promote walking/carpool projects, and strengthen inter-municipal transport links.

5 Strategic Lines

04

Results feedback & Next Steps

- ✓ Prepare and **disseminate** a comprehensive report to the local government team, the Health Council, and all participating citizens, organisations, professionals and public administrations.
- ✓ Ensure that the **climate emergency remains a central focus** in recovery and reconstruction processes.
- ✓ Foster **collective reflection** on local climate action and shared responsibility.
- ✓ Establish thematic **working groups** for each strategic line to co-design and detail concrete actions.

Benetússer

Informe de
resultados del
proceso
participativo
de análisis de
situación con
**ENFOQUE
CLIMÁTICO**



Entornos de Vida

Promueve: Ayuntamiento de Benetússer



Diciembre de 2025

6. Conclusions

Conclusions: Municipality Assessment

High Climate Vulnerability

Strong impacts on elderly, people with disabilities, youth, and low-income groups due to urban density, low green areas, car dependence, and fragile housing.

Clear Priorities

Emergency prep, public transport & active mobility, youth spaces, heat protection, service info, updated vulnerable census.

Underused Community Assets

Public facilities, associations, health & social services, and climate refuge spaces exist but lack coordination & visibility.



Long-Term Planning Gap

Actions are short-term and politically dependent; need stable policies and energy-efficient, resilient projects.



Participatory Governance Needed

Citizens want to engage but need accessible info, clear channels, and visible outcomes.

Conclusions: Participatory Process

- ✓ Worsened vulnerabilities post-extreme event
- ✓ Action proposals target social determinants
- ✓ Need for deeper engagement
- ✓ Coordination gaps
- ✓ Opportunities for learning, empowerment, and replication



Thank
You!

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Paloma Altozano: altozano_pal@gva.es

Benedetta Prisciano: prisciano_ben@gva.es



GENERALITAT
VALENCIANA



Fundació
Fisabio



JA Prevent NCD
Joint Action Prevent Non-Communicable Diseases

Some reflective questions...

- How **empowering** are these participatory processes for citizens who have already experienced extreme events?
- To what extent do participants feel they can **influence decisions** that affect their health, safety, and environment?
- Are the **efforts** of people who have endured the extreme event being **recognized** and built upon in follow-up actions?
- Are **collective capacities** reinforced to enable joint action?
- Do these participatory processes ensure **representation** across all population groups?

Working in Collaboration to Better Flood Resilience

Parallel session I: Darren Eckford
CIWEM

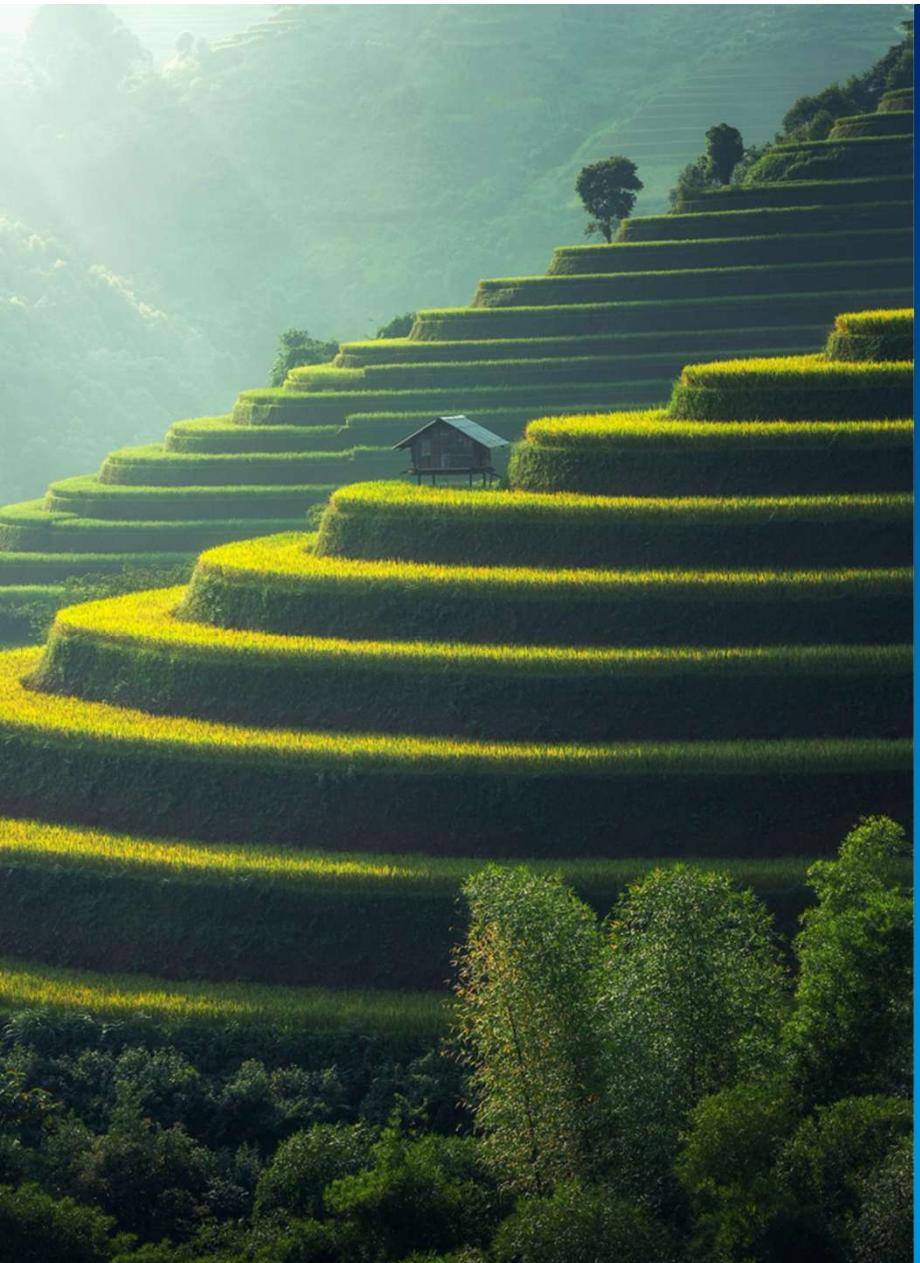
Partnership working

collaborating for better water outcomes

Behaviour matters

the evidence is clear





It starts with us

**What are the most important aspects
in successful partnership working?**

**Partnership failures are systemic and generally
related to behavioural misalignment**

CIWEM

Understanding partnerships

A partnership effort

- A need identified
- A partnership formed
- A shared purpose and mission

'More resilient communities through more effective partnerships'



Criteria	Requirements
Location	1 international case study CRCWSC
Water management outcome/ focus	Minimum 1 flood risk focussed case study LwW, NIDP, SFAS, NLAA Minimum 1 water quality focussed case study RLCP Minimum 1 water resources focussed case study WRE Minimum 1 comprehensive/integrated water management GMIWMP, NC, CRCWSC, TW, WINEP
Partnership type	Minimum 1 public-private and third sector WRE, NLAA, RLC, CRCWSC, NC
Size of partnership	Minimum 1 with 2-3 partners GMIWMP Minimum 1 with 4-10 partners LwW, SFAS, NC, NLAA, TW WINEP Minimum 1 with 10+ partners WRE, RLC, CRCWSC, NIDP
Scale	Minimum 1 community/ local scale SFAS Minimum 1 regional scale All others (multi-scalar)
Strategic vs. Delivery-led	Minimum 1 strategic WRE, NLAA, GMIWMP Minimum 1 project delivery-led SFAS, NIDP Minimum 1 both strategic and delivery-led LwW, RLC, CRCWSC, NC, TW WINEP
Success of partnership	Potentially include case studies where things did not go well Include 1-2 with evidence of successful delivery of outcomes LwW, RLC, NIDP, NC Include 1-2 with evidence of successful monitoring and evaluation LwW, WRE, NIDP, NC Awards and/or recognition LwW, SFAS, CRCWSC, RLC, NIDP, NC
Community involvement	Minimum 1 community-led case study RLCP Minimum 1 case study with significant community involvement and engagement LwW, NLAA
Longevity/ replicability	Minimum 1 with replicable projects and or water management approaches/systems LwW, SFAS, RLC Minimum 1 w/ evidence of evolution/ continuity into successor initiatives NLAA/NIDP, CRCWSC, NC/GMIWMP
Other differentiator	Availability and accessibility of right information/ key people to approach LwW, WRE, SFAS, GMIWMP Readiness of partnerships to be approached RLCP, NLAA, NIDP, NC, TW WINEP, CRCWSC Indicative potential to provide learnings on the key subjects of the review WRE, GMIWMP, NC Learning material has already been produced which can be incorporated WRE, NC, NLAA, CRCWSC, NIDP Multiple mentions/ overlaps across sources LwW, NIDP, NC, GMIWMP, WRE, RLC, TW WINEP

Partnerships in practice

Evidence drawn from experience

1. Understanding partnerships, their need and value and where to start
2. Enabling proportionate governance and funding
3. Developing a shared vision, values and purpose
4. Fostering trust and respect
5. Building connections across silos
6. Collaborative leadership: mentalities, skills and behaviours
7. Maintaining momentum and managing setbacks

The evidence points to...

Five approaches

Investing in Relationships

Trust and respect are essential to sustain collaboration during challenges in partnerships.

Foster collaborative mindsets, behaviours and actions

Partners prioritize collective goals with curiosity, empathy, and generosity.

Ensure shared power and benefits

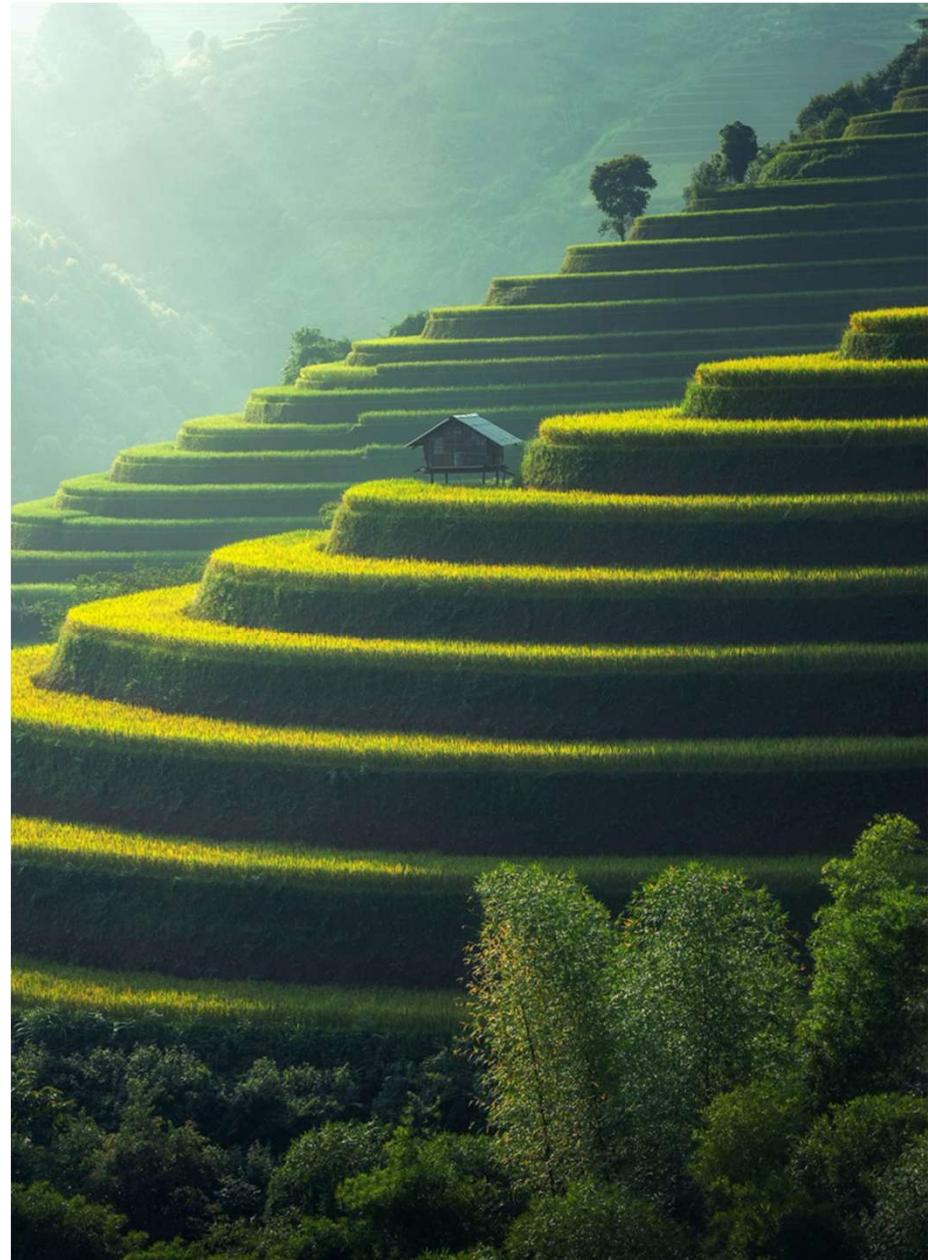
Equity through transparent decision-making ensures all partners gain value.

Build integrity and credibility

Open communication and consistent delivery build stakeholder confidence.

Span boundaries

Working across disciplines and sectors leverages champions bridging gaps



The evidence points to...

Six stages

Initiation

Partnerships start with clear purpose, mutual understanding, and early engagement to seed collaboration effectively.

Creating and maintaining a partnering environment

Creating a partnering environment requires trust, inclusivity, transparent communication, and shared identity among members.

Roles, responsibility and contribution

Clarifying roles and responsibilities prevents misunderstandings and ensures accountability, often formalised by partnership tools.

Communication, engagement and decision-making

Effective communication, engagement, and structured decision-making maintain momentum and fairness in partnerships.

Adaptability and resilience

Partnerships must adapt to changing priorities and external shocks through iterative planning and regular reviews.

Reviewing, evolving and ending well

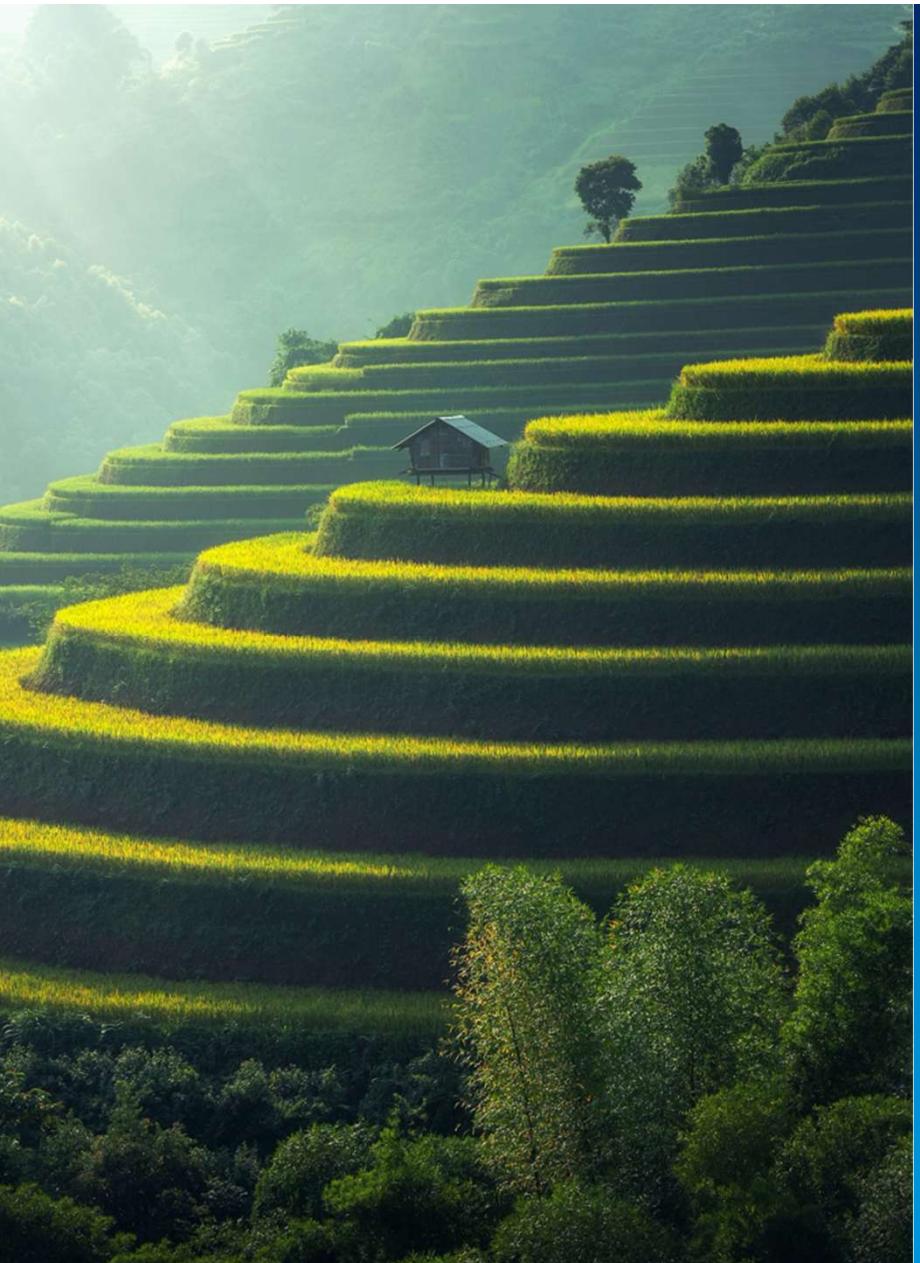
Regular review captures lessons, celebrates achievements, and ensures constructive closure or continuation of partnerships.



What derails partnerships?

and how to stay on track



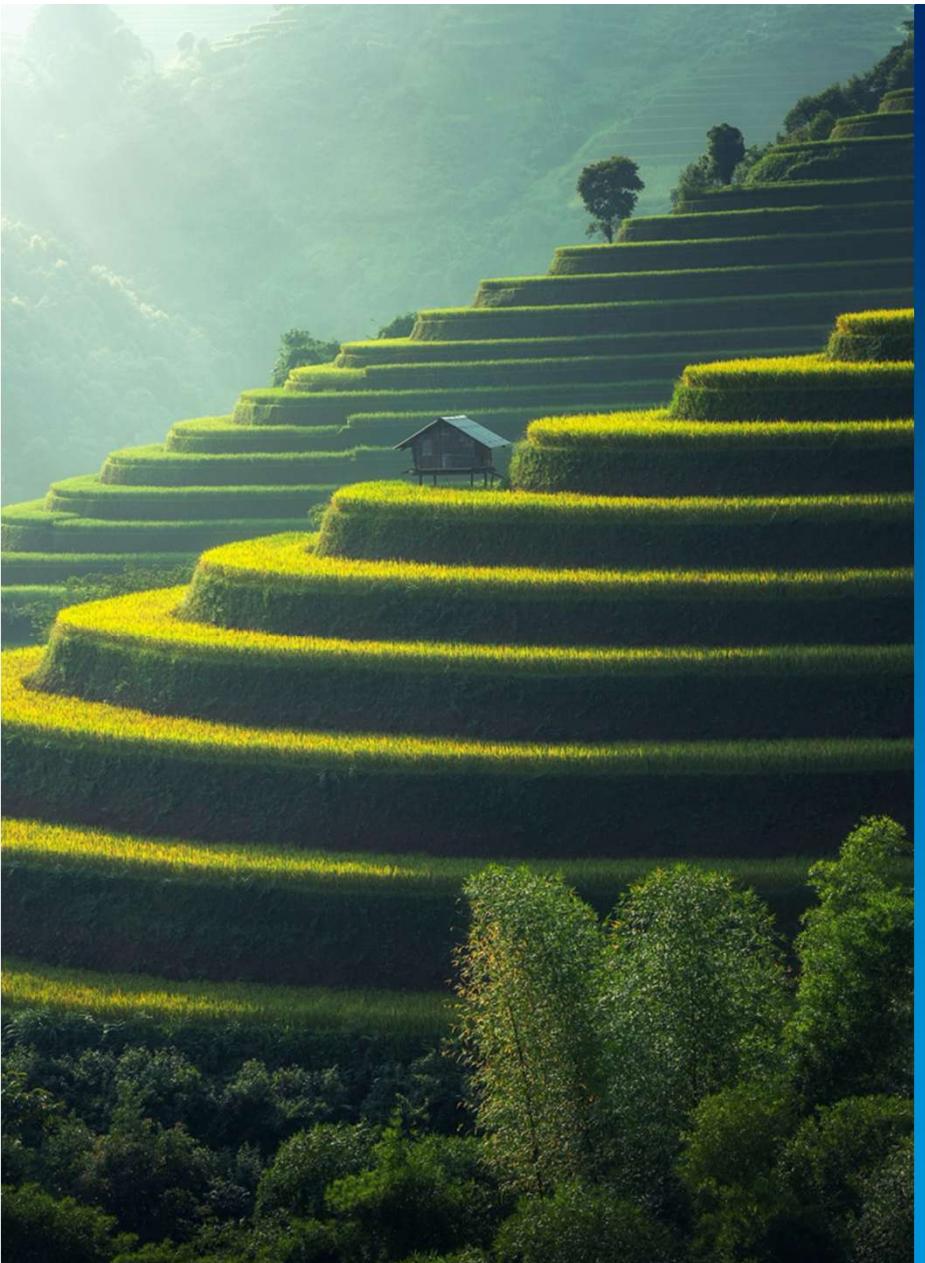


Biggest barriers

The evidence suggests...

1. System-level distrust
2. Siloed mindsets
3. Partnership regulation
4. Reliability
5. Communication and co-ordination

Poll: Which barrier is most prevalent in your partnering experience?



Recurring challenges

In partnership working

Barriers to Collaboration

System-level distrust and siloed behaviours undermine effective partnership collaboration and trust.

Impact of Misalignment

Misaligned goals, timelines, and communication frameworks lead to inefficiency and stakeholder frustration in partnerships.

Mitigation Strategies

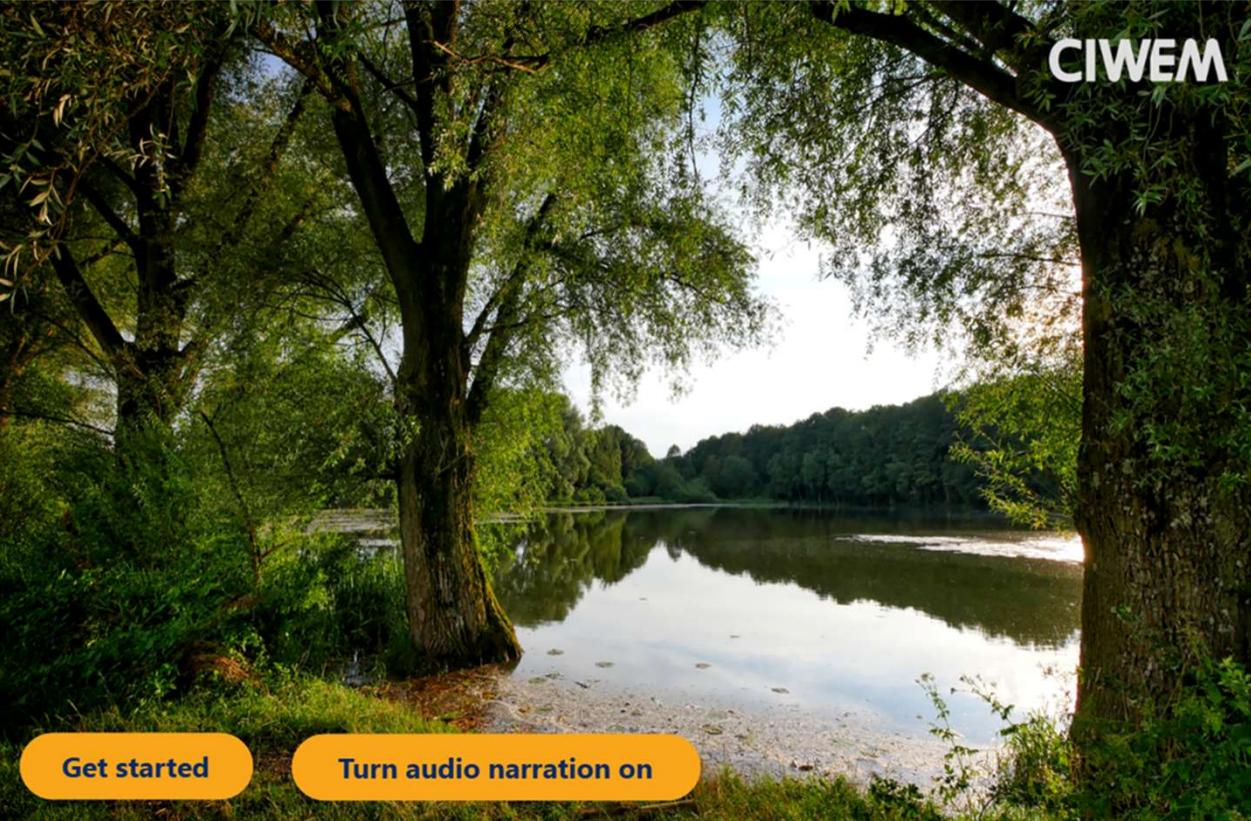
Transparent governance, accountability, and neutral communication build trust and improve partnership resilience.

Tools and Continuous Improvement

Using tools like Partnership Canvas and regular reviews supports alignment and adaptive partnership development.

Tools for success

Confident partners, aligned behaviours



CIWEM

[Get started](#)

[Turn audio narration on](#)

**Working in partnership: approaches and
behaviours for effective collaboration**

| 2026

CIWEM

What 'good' looks like in practice

Some key strengths from our case studies

Living with water



Identity, trust, legitimacy

Water resources east



Shared power, structured participation

Northumbrian integrated drainage partnership

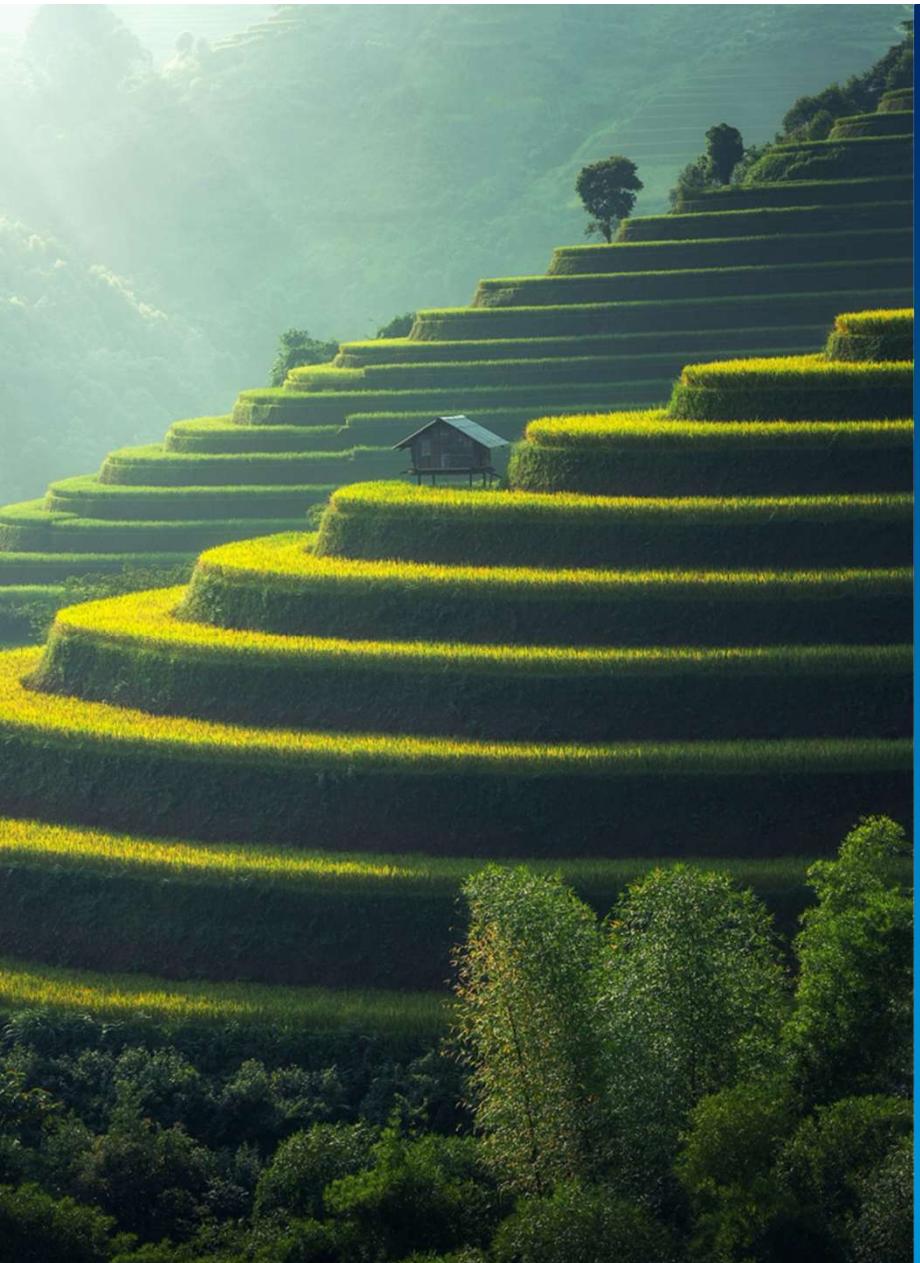


Pace, inclusion through design

Micro-lab one

shared power and representation





Your turn

Shared power and representation

Partnership canvas

The Canvas visualizes purpose, roles, decision rules, and outcomes to foster clarity and shared understanding in partnerships.

Representation checklist

This checklist ensures equity by identifying under-represented voices and promoting meaningful, inclusive participation.

Reducing ambiguity and conflict

Tools prompt discussions on influence, benefits, and cadence to reduce ambiguity and prevent conflicts early on.

Digital support

The digital tool offers interactive templates and guidance to sustain good partnership practices beyond direct interactions.

Partnership canvas

Adaptable to your partnership



Partnership Canvas (Template)

People & Roles What are our names and the roles we have in the partnership?	Goals What do we want to achieve as a partnership? What are our key goals that are SMART (specific, measurable, achievable, relevant and time-bounded)?	Purpose Why are we doing what we are doing in the first place?	Values What do we stand for? What are our guiding principles? What are our common values that we want to be at the core of our partnership?	Rules & Action Points What are the rules we want to introduce after doing this session? How do we communicate and keep everyone up to date? How do we make decisions? How do we execute and evaluate what we do?
Strengths & Assets What are the skills that we have in the partnership that will help us achieve our goals? What the interpersonal/soft skills that we have? What are we good at, individually and as a partnership?	Personal Goals What are our individual personal goals? Are there personal agendas that we want to open up?		Needs & Expectations What does each one of us need to be successful? What are our personal needs towards the partnership to be at our best?	Weaknesses & Development Areas What are the weaknesses we have, individually and as a partnership? What should our partners and stakeholders know about us? What are some obstacles we see ahead of us that we are likely to face?

Representation check-list

Equity from the beginning

- Equity and legitimacy
- Representation
- Barriers to engagement
- Intentional decision making

Discuss: Where does influence 'Really' sit in your current partnerships?

Who might be missing?

Participation & Representation Check – Partnership Tool

Use this checklist to test whether the partnership is equitable, inclusive and legitimate

1. Who is represented?

- Which organisations, groups or communities are formally involved?
- Who attends regularly vs occasionally?
- Whose voice is dominant in discussions and decisions?

2. Who is missing or under-represented?

- Who is affected by decisions but not present?
- Are there community, third sector or delivery voices absent?
- Are future users or place-based perspectives missing?

3. Power & influence

- Who influences agendas, funding or final decisions?
- Is power formal, perceived, or relational?
- Are there safe ways to challenge or dissent?

4. Meaningful participation

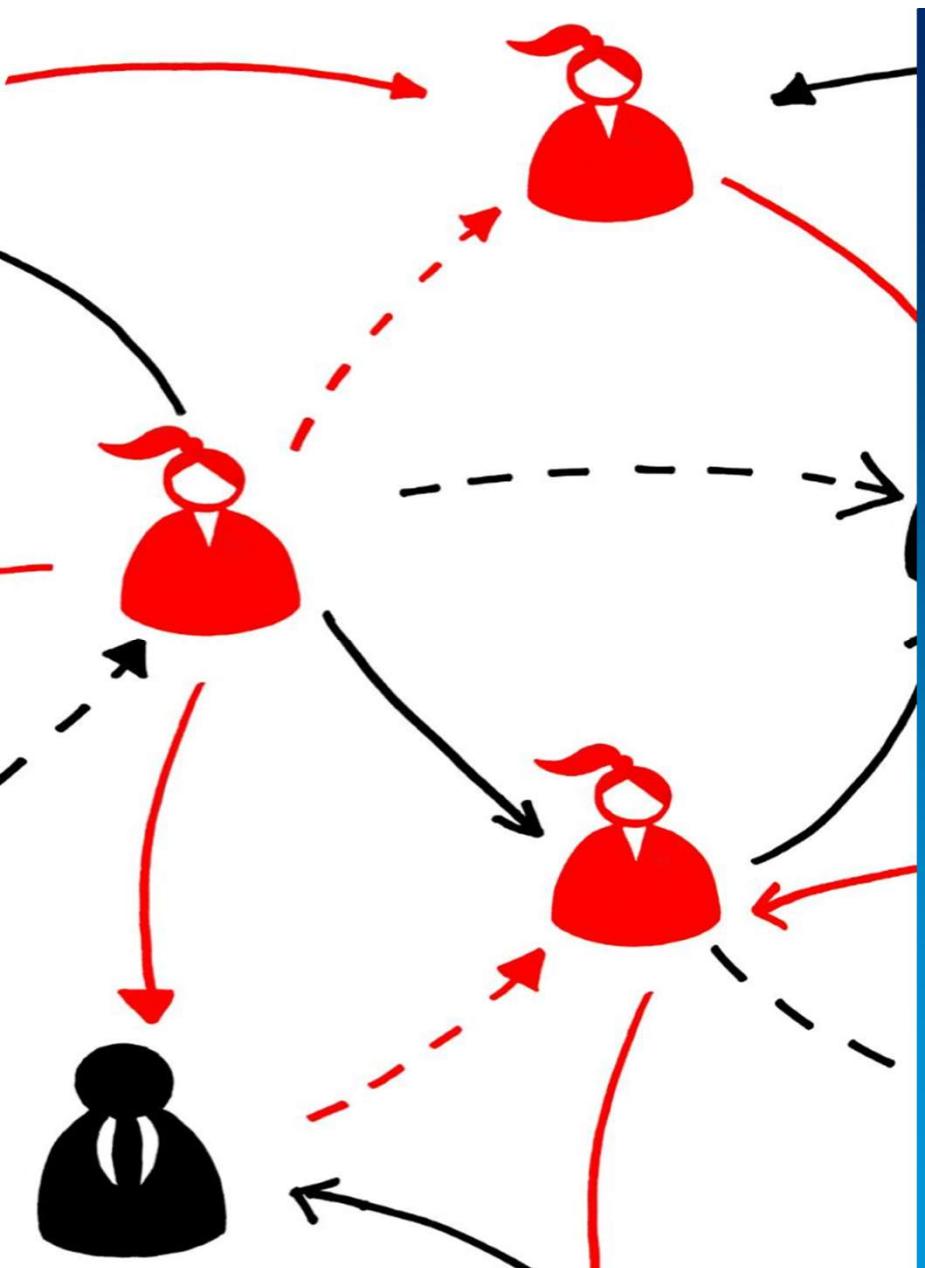
- Are people shaping decisions or only being consulted?
- Do formats, timing and language enable contribution?
- Are contributions visibly acknowledged and used?

Reflection: What one change would most improve representation and legitimacy in this partnership?

Micro-lab two

decisions without getting stuck in the mud





Your turn

Decision-Making Clarity and Convergence Rules

Convergence Over Consensus

Prioritize progress through convergence, balancing majority agreement and respect for minority views to avoid decision paralysis.

Defined Decision Rules

Set clear decision rules upfront, including convergence tests and documenting dissent to maintain fairness and clarity.

Psychological Safety in Language

Foster openness by using inquisitive language that encourages dialogue and reduces defensiveness in decision-making.

Role Clarity via RASCI

Use RASCI charts to define roles of Responsible, Approver, Support, Consulted, and Informed, reducing confusion and duplication.

RASCI

Responsible, Approver, Support, Consulted, and Informed

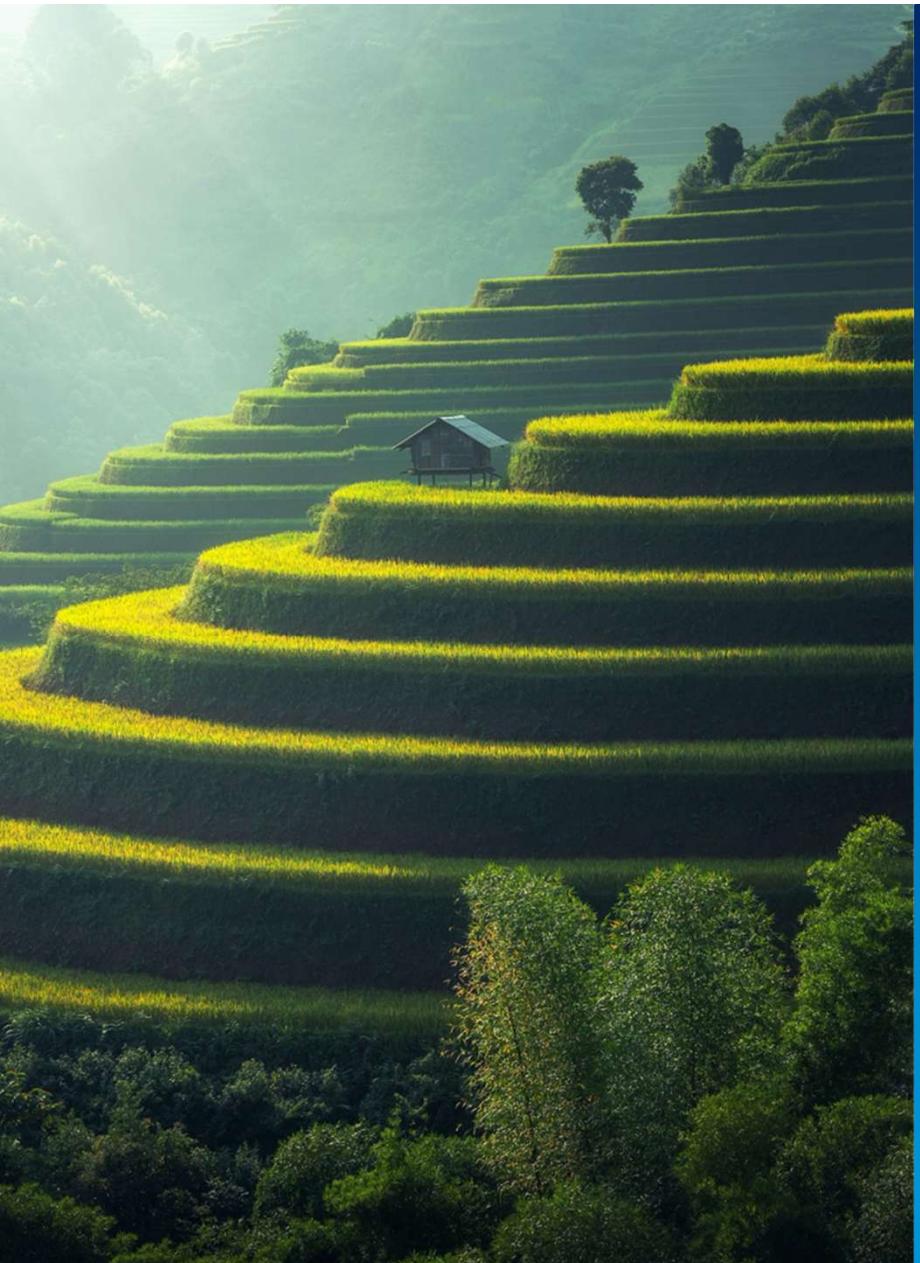


RASCI

What's next?

conclusions and call to action





Behaviours are owned By all of us...

Core workshop takeaways

What are yours?

1. Behaviours are the lead enabler of partnership working
2. Equity and inclusion mechanisms are non-negotiable
3. Basic agreements can create a different sentiment for the same outcome
4. Convergence beats consensus

Commitment to micro-actions

What can you do differently?

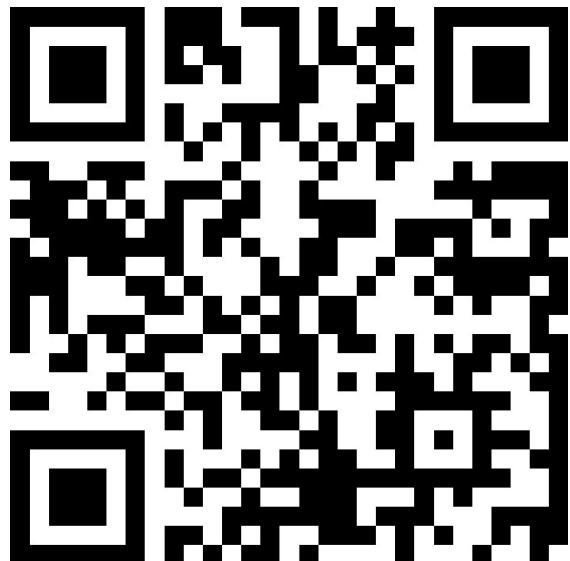
Ongoing support

The digital tool enables structured, reflective practice supporting consistency and inclusivity across partnerships.

Questions?

learning@ciwem.org | www.ciwem.org | 020 7831 3110

venture



Scan the QR code with your phone or tablet camera

OR

Log into a web browser and enter – www.slido.com and enter Floodresilience2026 in the box with 'enter code here'

FLOODRE

AECOM

 **AtkinsRéalis**

Template games for community engagement and public consultation

Parallel session J: Agnessa Spanellis
University of Edinburgh



Introduction to FeME and template games

Dr Agnessa Spanellis, FeME Deputy Director
Senior Lecturer in Systems Thinking
University of Edinburgh Business School

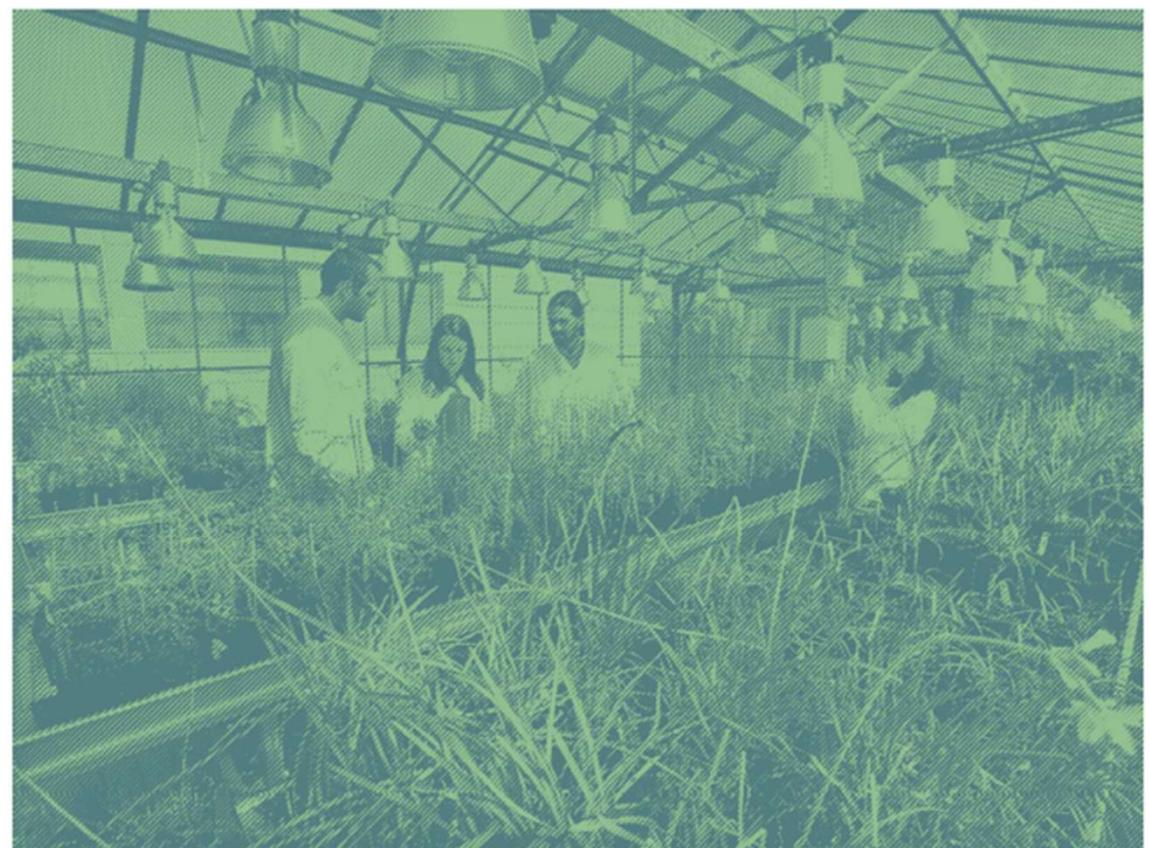
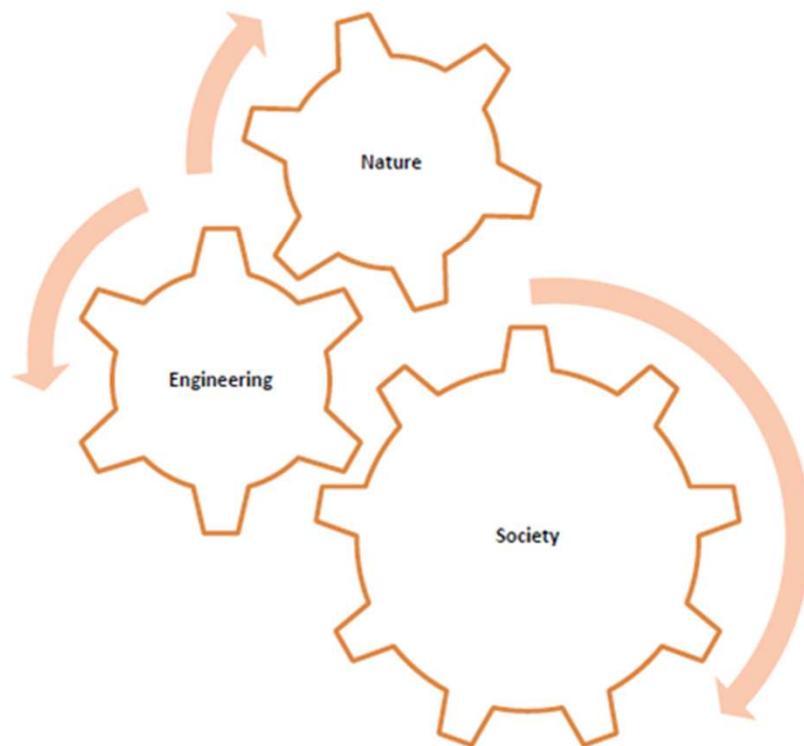


University
of Glasgow

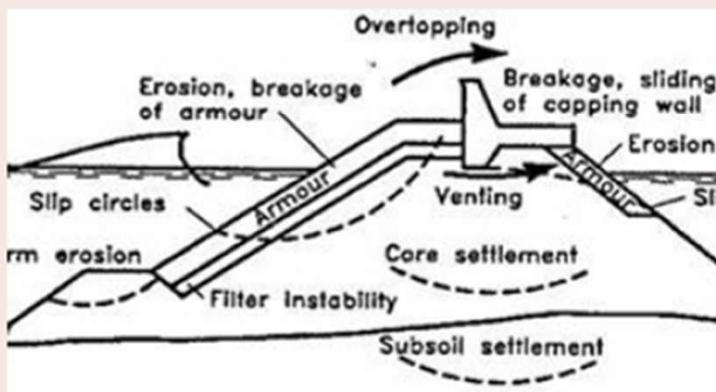


Engineering and
Physical Sciences
Research Council

What is the role of engineering in the climate crisis?



How do engineers speak about failure? What is a Failure Mode?



A step-by-step **approach to identify and prioritise potential failures in a design, manufacturing process or product.**

By analysing the causes and effects of the failure modes, engineering provides a pathway to increase reliability and improve outcomes.

- What are the causes of these?
- What are potential effects of these failure modes?
- How do we avoid these in the future?

Our FM approach



FM 1 – Diverse Engineering

that builds on female talent through education

FM 2 – Inspired Engineering

that provides socially acceptable solutions

FM 3 – Connected Engineering

that provides globally accessible data to solve global issues

FM 4 – Inclusive Engineering

that supports underrepresented groups

FM 5 – Interdisciplinary Engineering

that happens at a global scale

FM 6 – Agile Engineering

that adapts to our resources in a threatening climate

Template games for community engagement

The game does three things:

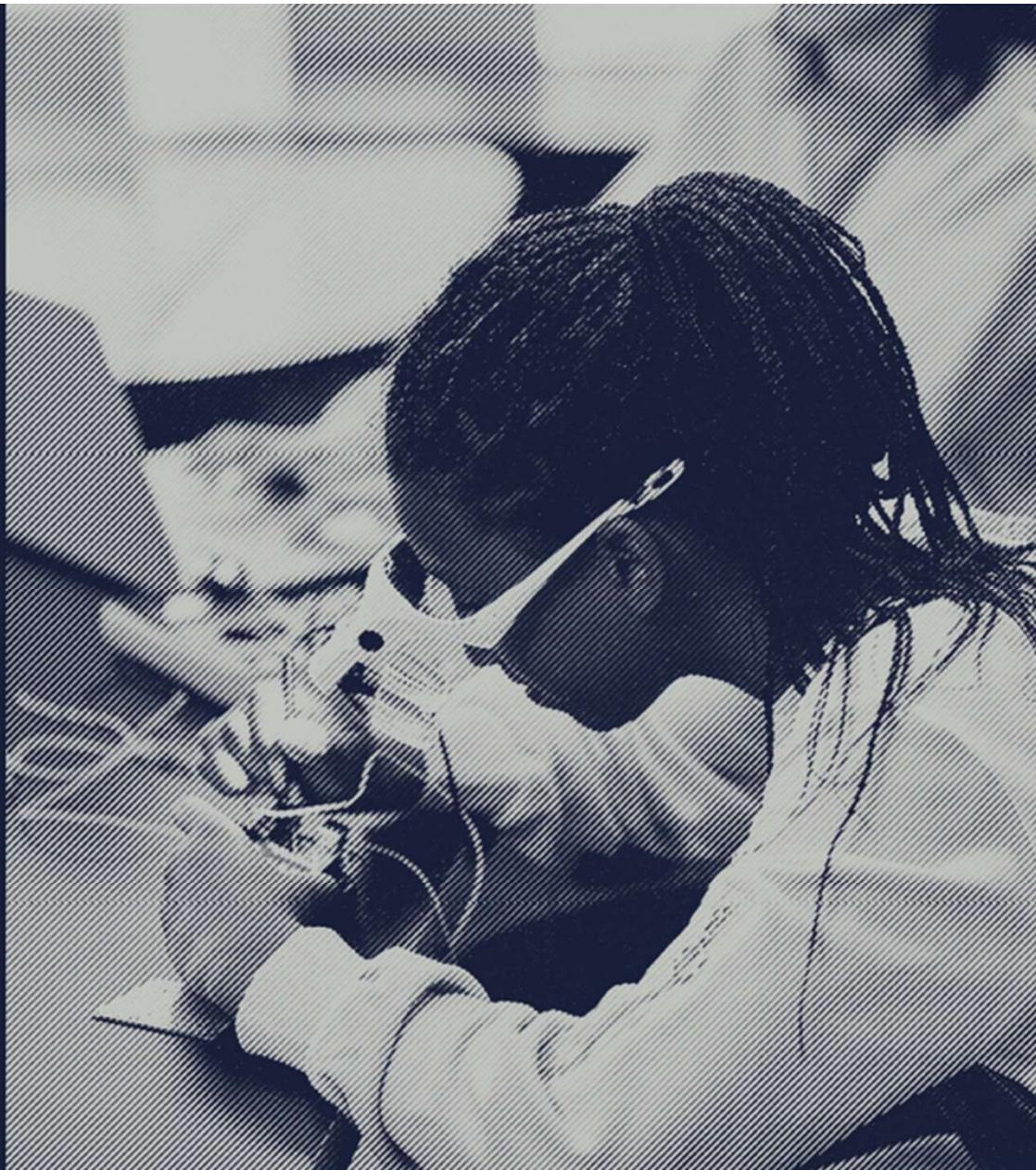
- It moves the conversation and creates a more nuanced and productive dialogue.
- It creates spaces for everyone to contribute, not just the loudest voices, making the process more inclusive.
- It creates markers for AI through text on the cards enabling more sophisticated forms of analysis.





Let's play

- You are invited to try out one of the games yourself, designed for FeME to explore challenges with community engagement in deploying CC engineering solutions.
- Your discussions will be used to develop other practical tools for community engagement for the use cases you will have highlighted through the game.
- To record the conversations, we need your consent.
- If you share your email, we will share the results with you.





Thank you!

Connect with FeME network

feme@ed.ac.uk

www.feme.ac.uk

Template games with Otter Intelligence

otterintelligence@ei.ed.ac.uk

www.otterintelligence.com



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Flood Cafes

Parallel Session K: Bel Deering
Somerset Rivers Authority

FLOODRE

AECOM

 AtkinsRéalis



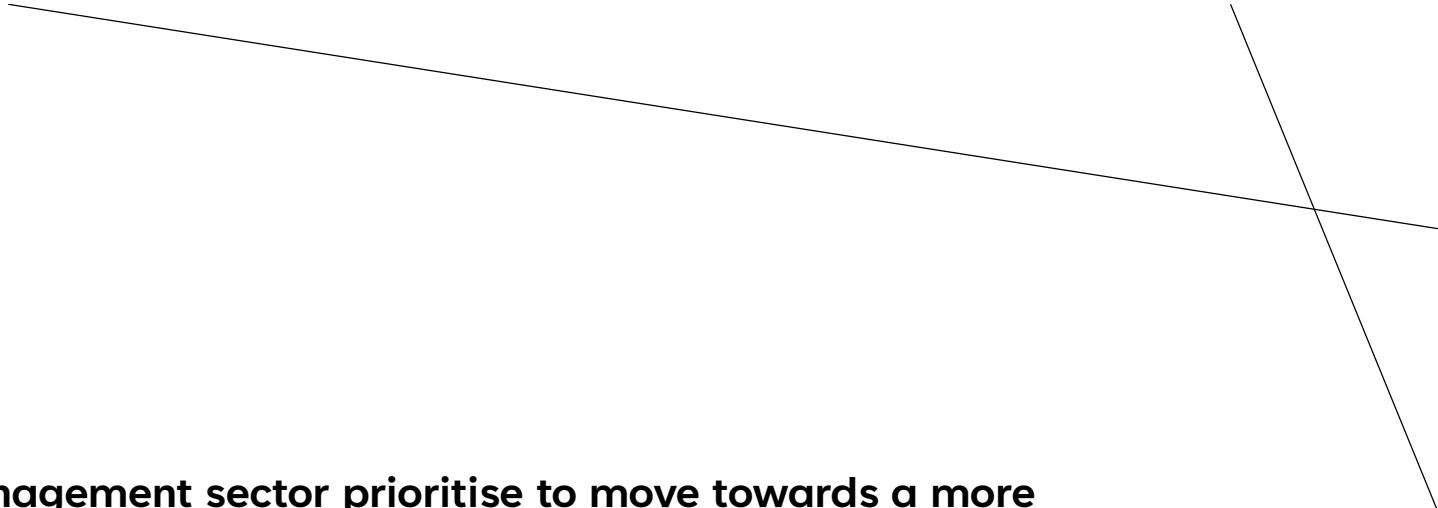
Early Career Professionals open space

Parallel session L: Ben Cooper
City of Edinburgh Council



AGENDA

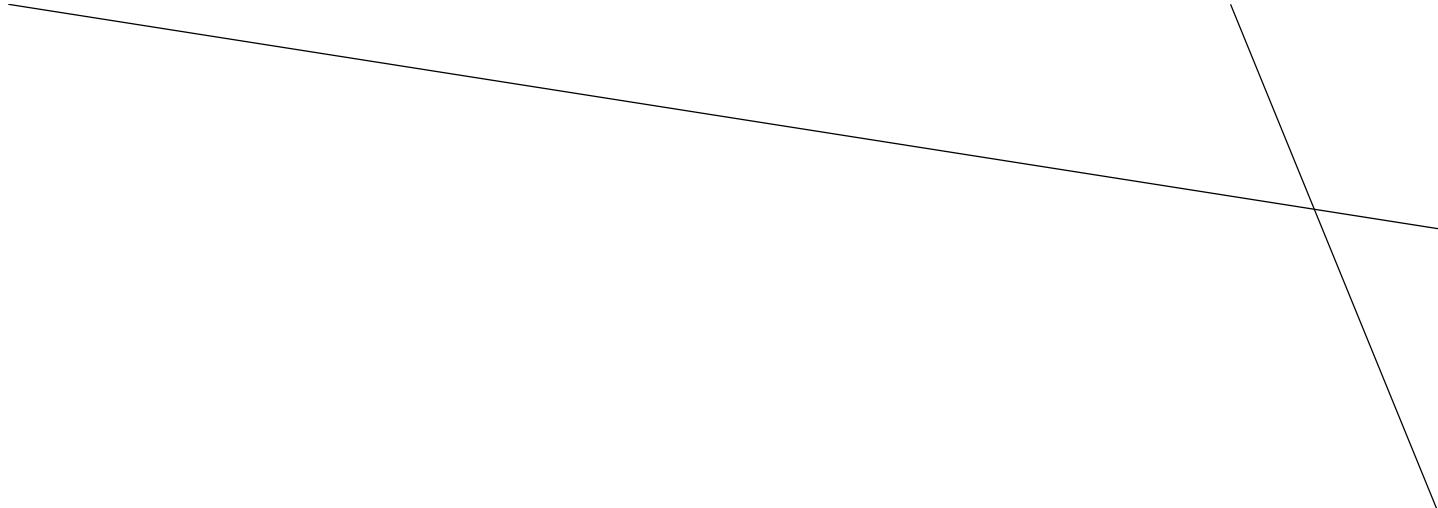
- Priorities for the industry?
- Survey discussion
- Close and Q/A



PRIORITIES

What should the flood management sector prioritise to move towards a more flood resilient Scotland?

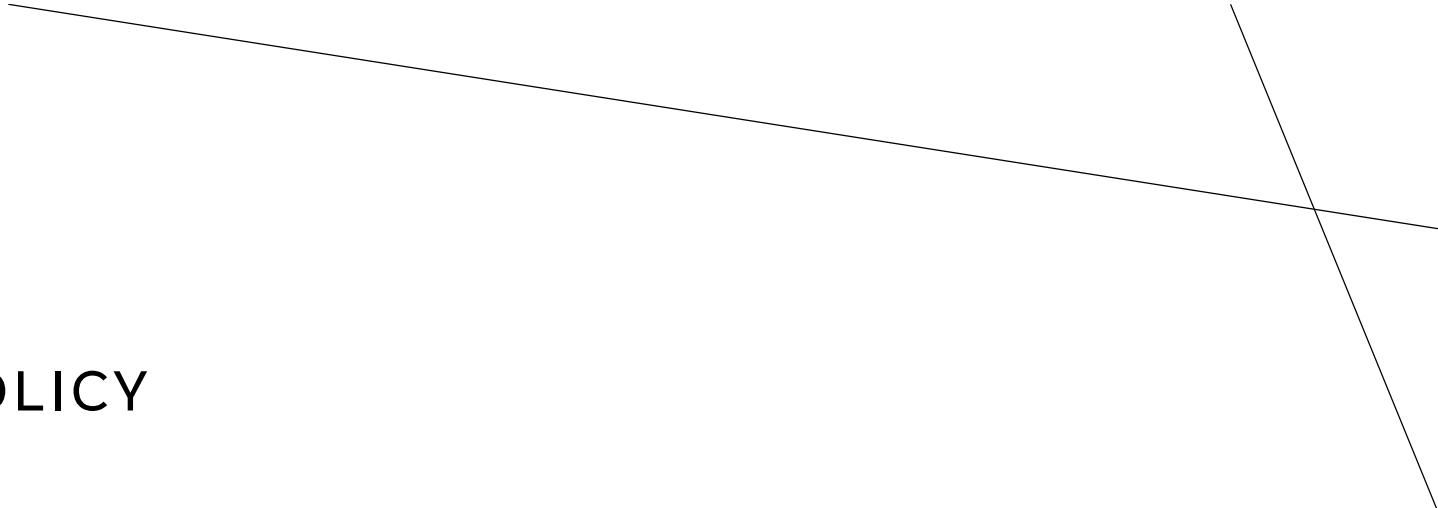
1. Climate adaptation
2. Closing gaps in policy - within flooding policy and/ or across different policy areas)
3. Increasing Scotland's knowledge and understanding of flood risk and resilience
4. Governance and systems to increase collaborative working
5. Performance of assets



CLIMATE

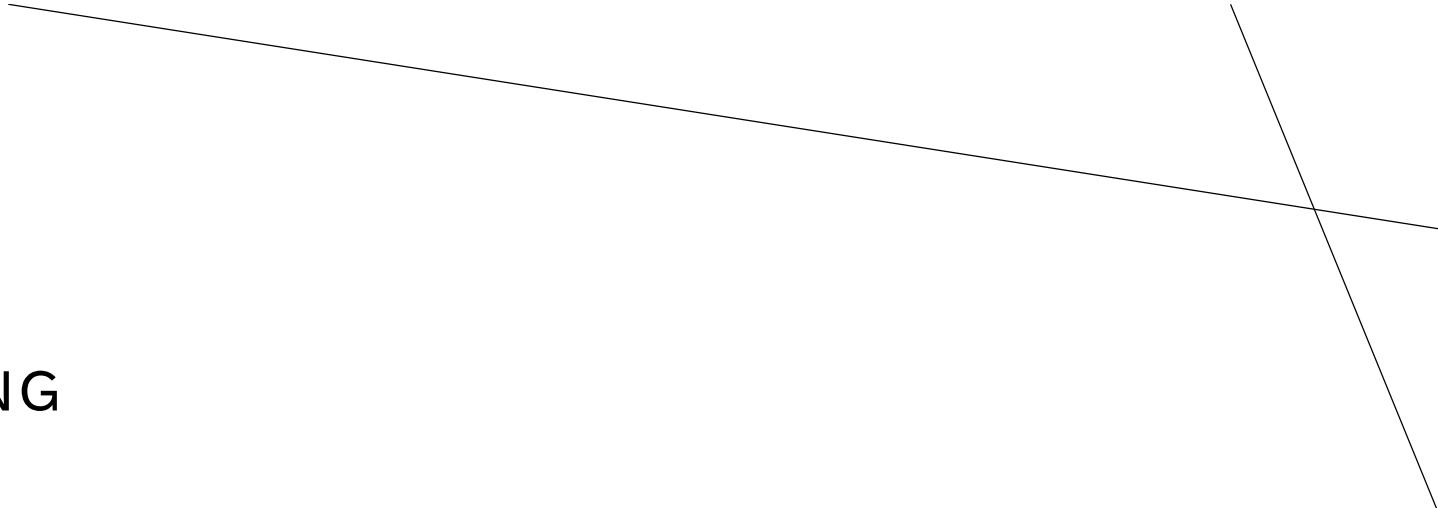
Climate change is a global issue that will have an impact on Scotland's flood resilience.

1. How do you see global trends/events/projects influencing decisions here in Scotland?
2. How is Scotland's changing climate influencing decisions?



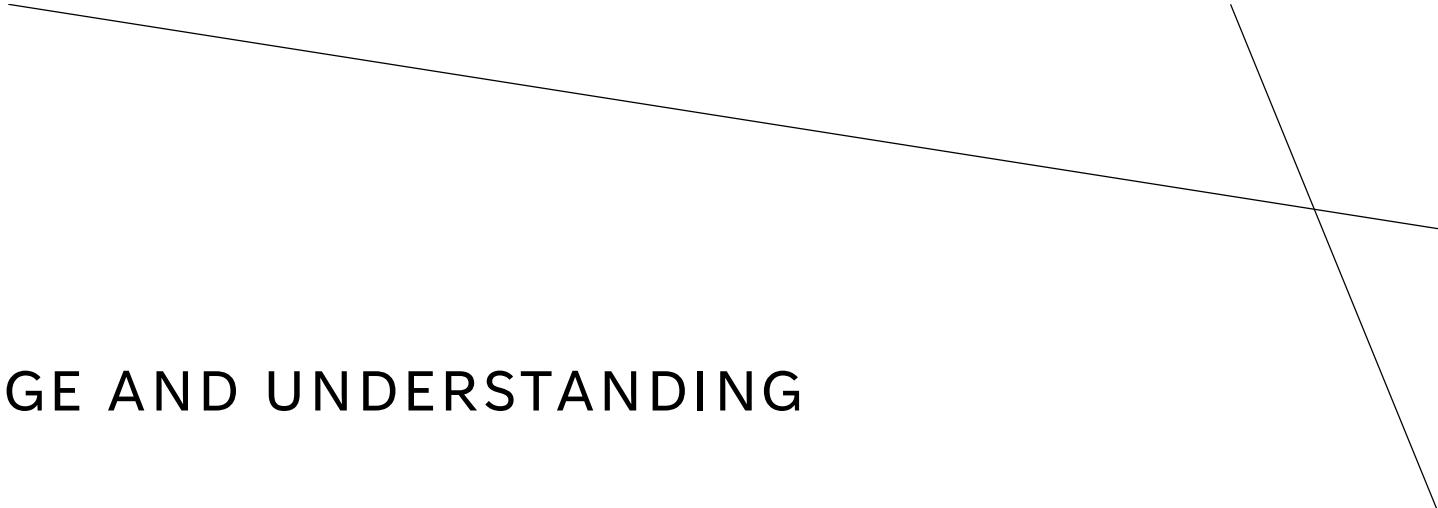
FUNDING AND POLICY

1. What are your thoughts on current funding models /approaches for flood management? How suited are they for longer term adaptation measures?
2. Where are the biggest opportunities and gaps in relation to policies that inform and influence flood management in Scotland?
3. If you could influence one policy, funding decision or challenge an industry norm, in order to better prepare for the future of flood management, what would it be and why?



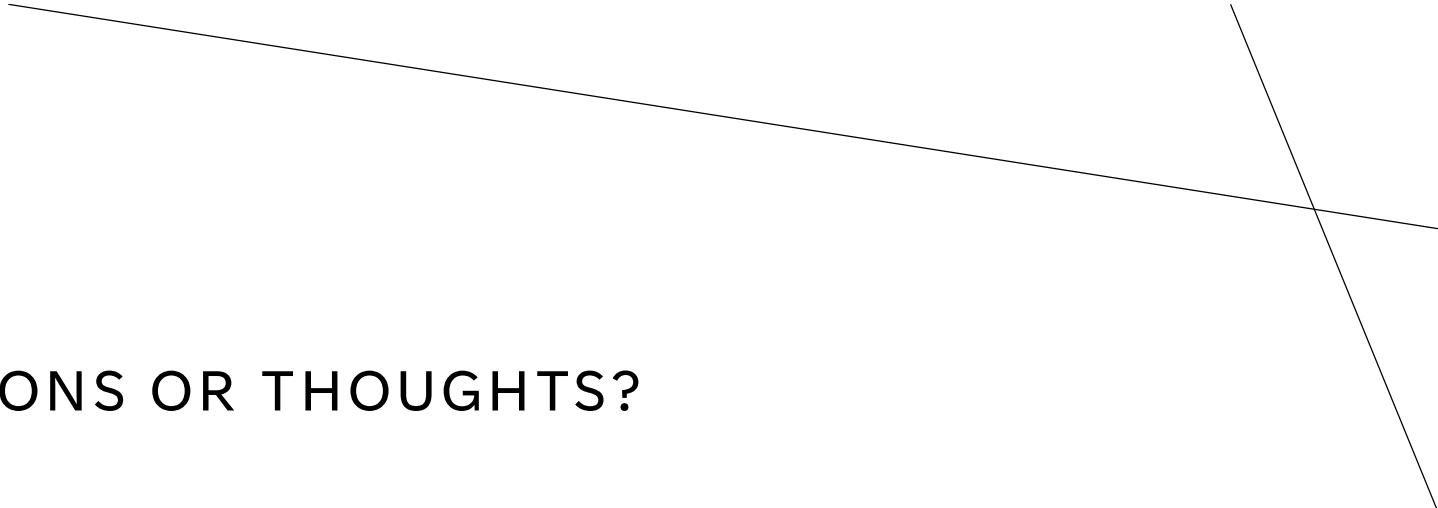
WAYS OF WORKING

8. How well do you feel that different sectors collaborate on flood management activities? What would more impactful collaboration look like?
9. How could the voice and the role of communities be enhanced



WIDER KNOWLEDGE AND UNDERSTANDING

10. What shifts in public understanding of flood management would help to advance further action?
11. What role could your sector play in relation to public understanding?
12. What opportunities and risks do you see in using AI and other data-driven tools in flood management decision-making?
13. What skills or knowledge do you think will be most critical for the future for those working in flood management ?



FURTHER QUESTIONS OR THOUGHTS?

For anyone who would be interested in joining an ECP group to help feed into the work done by Verture and the FRP, please do not hesitate to contact me :

ben.cooper@edinburgh.gov.uk

Communicating Seal Level Rise

Parallel session M: Rose Willoughby
The Met Office



Communicating Sea Level Rise Workshop

Rose Willoughby, *Knowledge Integration Lead*

February 2025 Matt Palmer, *Joint Director*





The UK National Climate Science Partnership

- The UK is a world leader in climate science, with capability distributed across a range of institutes.
- UKNCSP brings the Met Office and six NERC-funded research institutes together.



British
Geological
Survey



National Centre for
Atmospheric Science
NATIONAL ENVIRONMENT RESEARCH COUNCIL



National Centre for
Earth Observation
NATIONAL ENVIRONMENT RESEARCH COUNCIL





UK National Climate
Science Partnership

A hub for UK Climate Science

MISSION

To unite and harness UK
climate science capability,
advance international
partnerships, drive solutions
for a resilient, net-zero world



Activity areas



Climate observations

Enhanced network of observations and provision of data



Climate interventions

Deliver impartial assessments of different proposed techniques



Climate and nature

Enhance the provision of integrated climate and nature science



Sea level rise

Enhance capability and provide better advice to stakeholders



Climate modelling

Coordinated modelling for climate solutions



Natural hazards

Provide improved UK hazard prediction and preparedness to natural hazards

Interactive Workshop

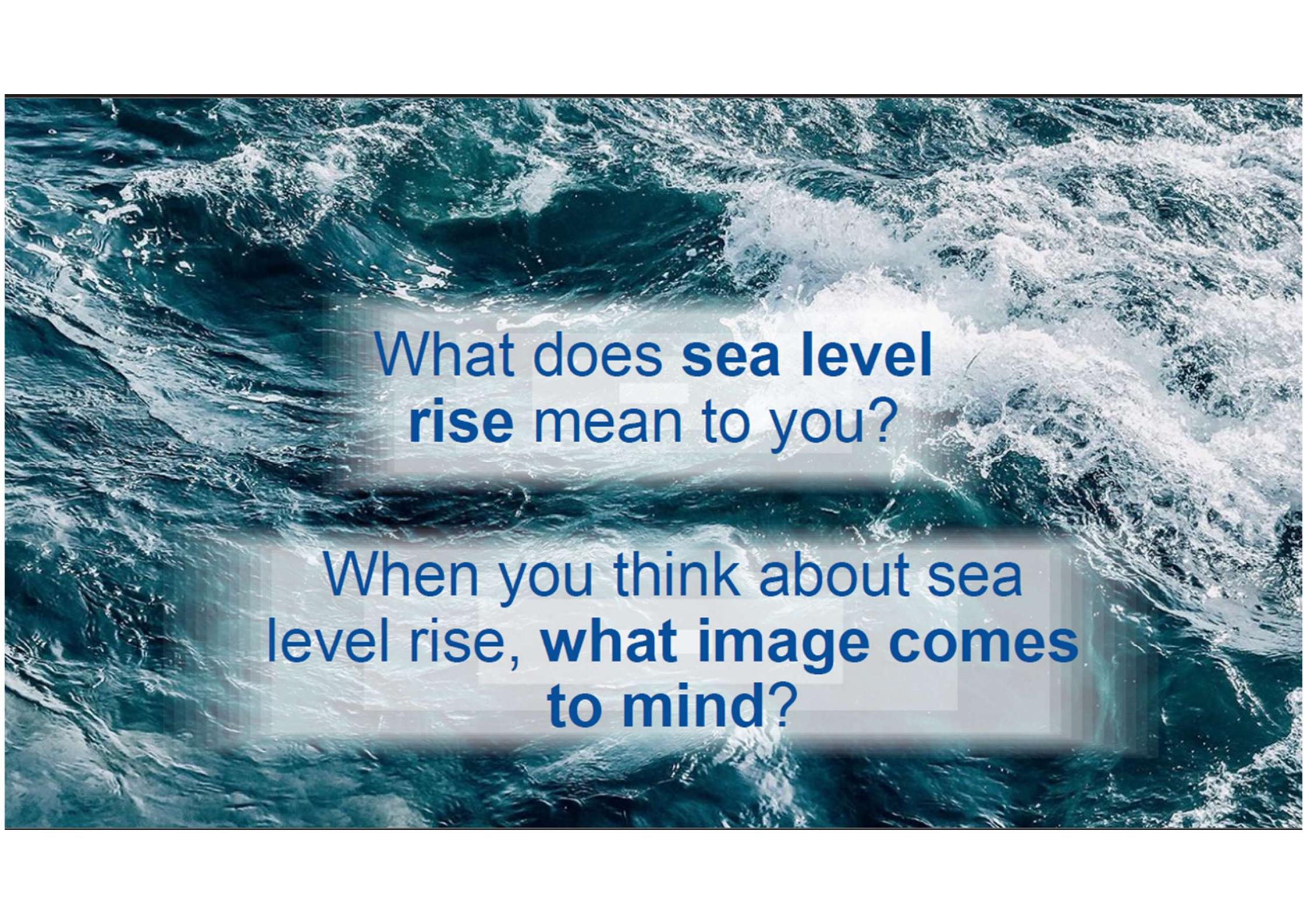
2 exercises

Gathering your
input

All perspectives
are important

Suggested ways of working

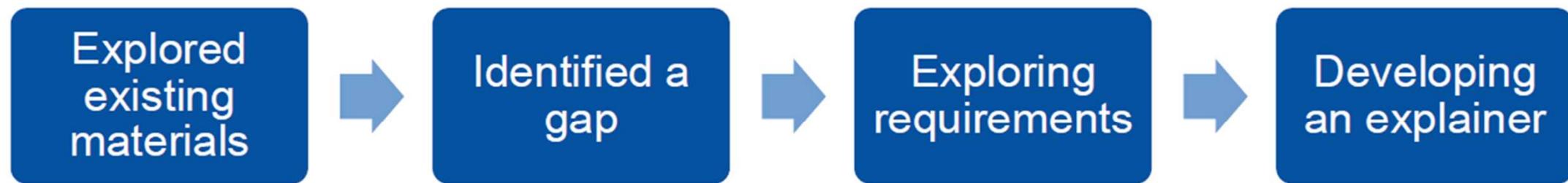
- Respect all participants and their views
- Share genuine opinions – **there are no right or wrong answers**
- Use simple language and share time fairly
- Silence is ok – it allows time for reflection
- Confidentiality – Chatham House Rules



What does sea level rise mean to you?

When you think about sea level rise, what image comes to mind?

Developing a Sea Level Rise Explainer



Target audience:

Those not currently aware of SLR issue whose decisions will be impacted by it.
e.g. Gov officials in housing, transport etc

Explainer intent:

1. Quickly and easily convey the issue of SLR
2. Show the importance of considering SLR in decision making.

Your thoughts...

What aspects do
you like?

What don't you like?
Is anything confusing or
unclear?

How could it be
improved?



Sea level rise now and into the future

Sea level rise can lead to:



Flooding



Salt water contamination



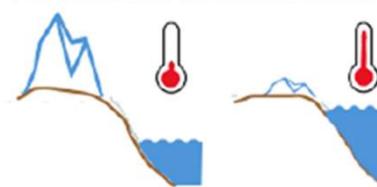
Coastal erosion

Globally, climate change is already driving sea level rise, and we are locked in some rise for centuries to come.

THERMAL EXPANSION OF OCEANS



MELTING ICE-SHEETS & GLACIERS



Our greenhouse gas emissions will determine how much sea levels will rise in the future.



+100 years

Edinburgh, today



2125,
Most likely scenario

or

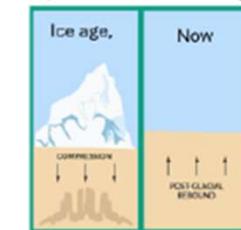


2125,
Worst case scenario

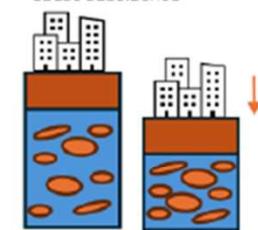
The extent of sea level rise varies **regionally**.

VERTICAL LAND MOTION

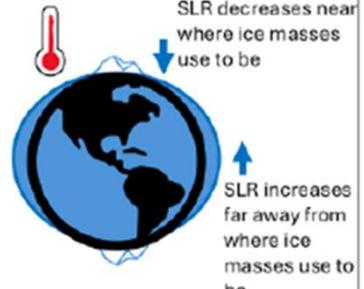
Some land is still rising after being compressed in the last ice age



Ground water abstraction can cause subsidence



CHANGING GRAVITATIONAL PULL ON OCEANS



SLR decreases near where ice masses used to be

SLR increases far away from where ice masses used to be

Find out how sea level could change in your area



Thank you for your input!

We are currently developing materials to communicate sea level rise
Your input today will shape these materials

• Stay in touch!



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Refreshments, Market Place and Networking

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Charting the Way Forward

Chair: Jo Kerr

Verture

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Developing Stronger Networks to Create Flood Resilient Communities and Places

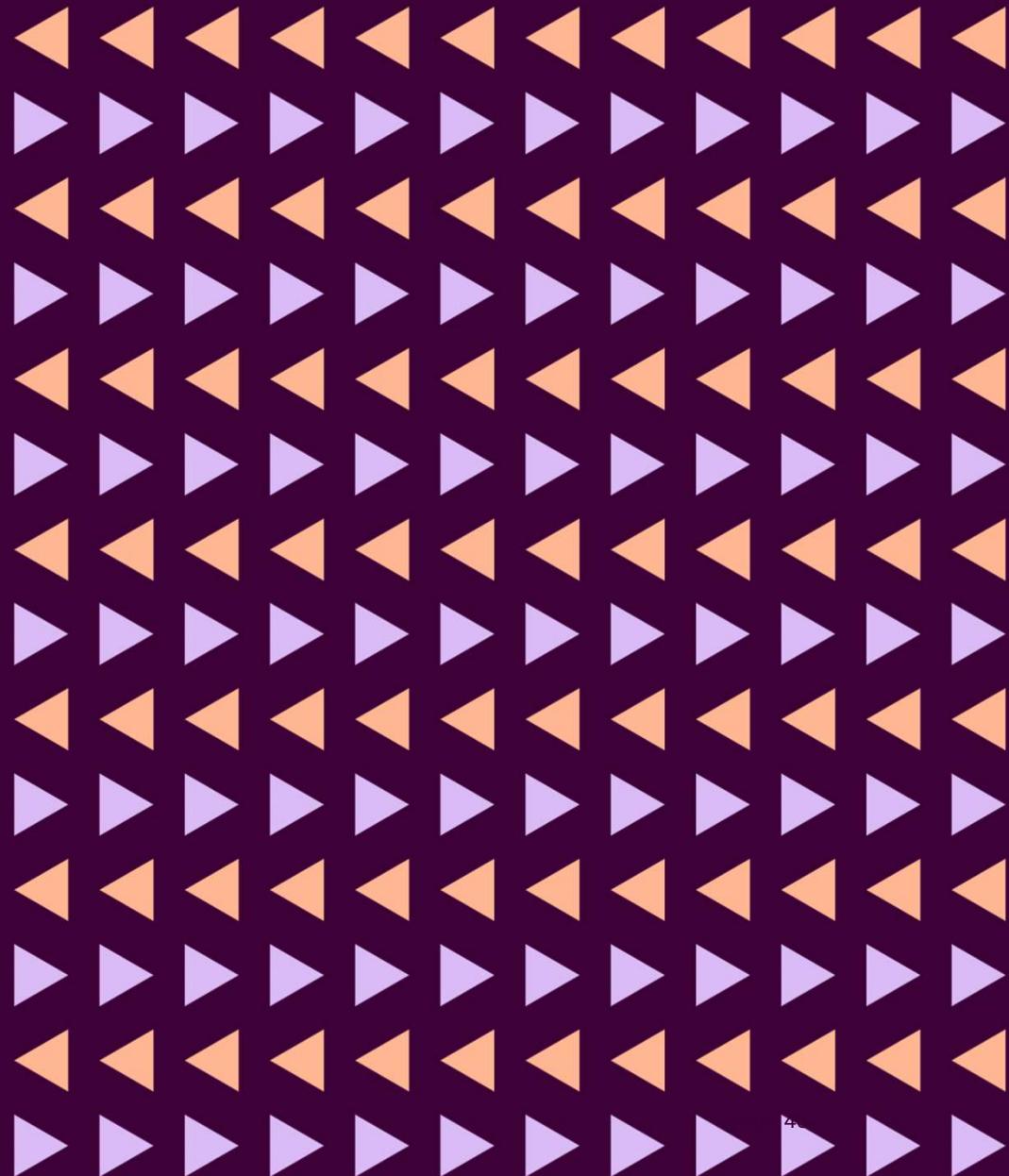
Ben Twist

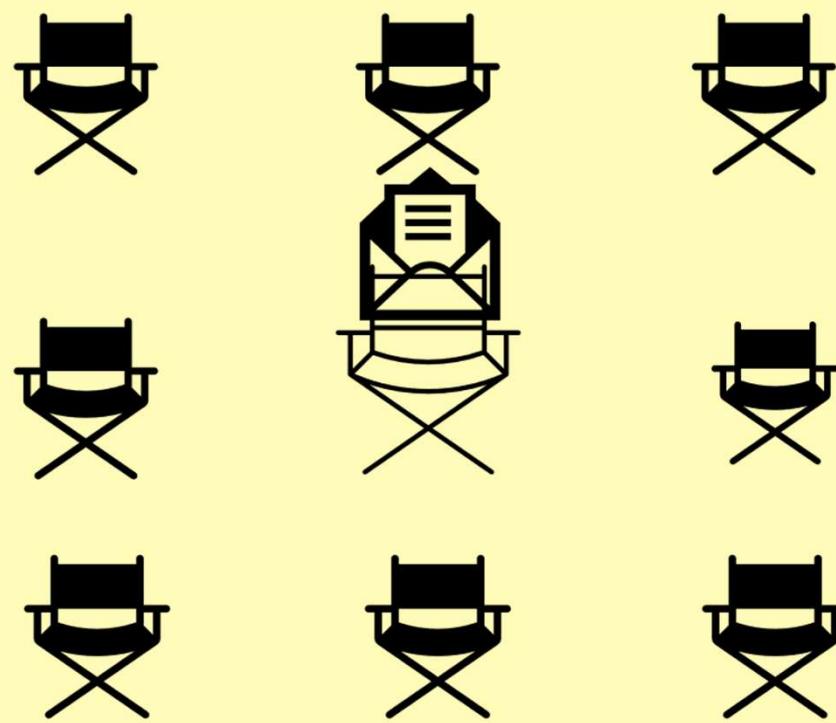
Creative Climate Scotland

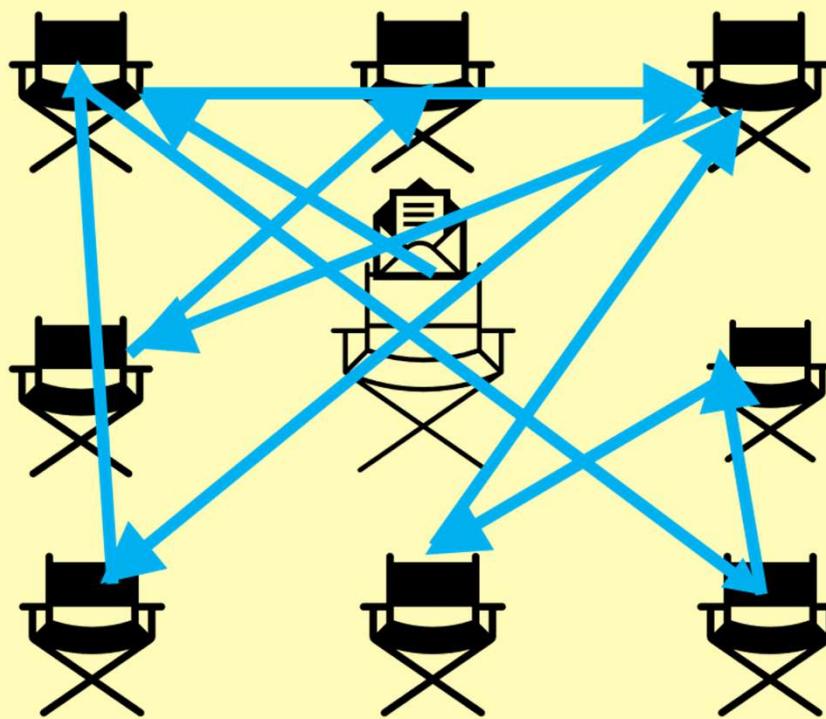
Charting the way forward

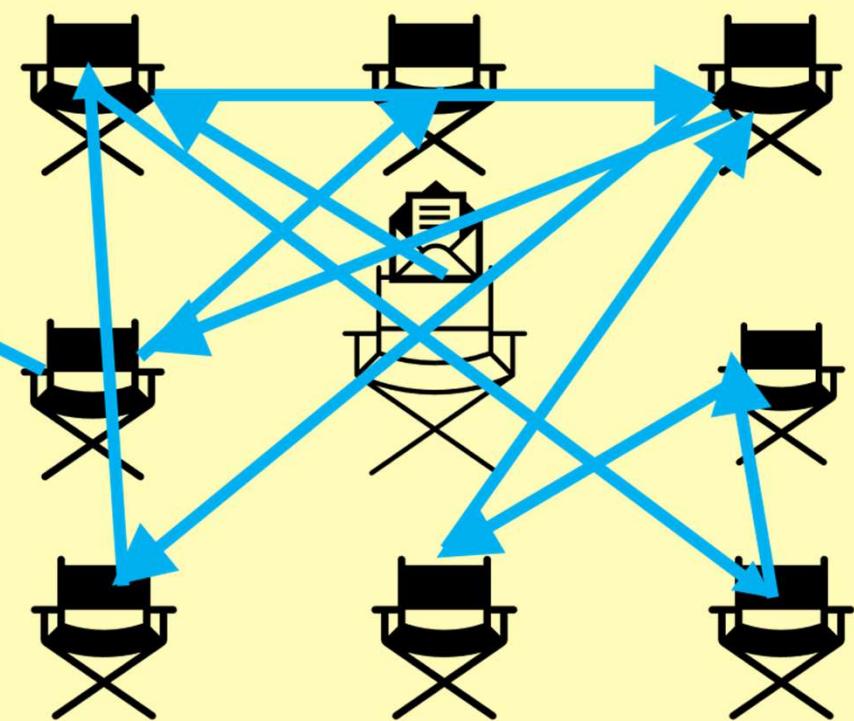
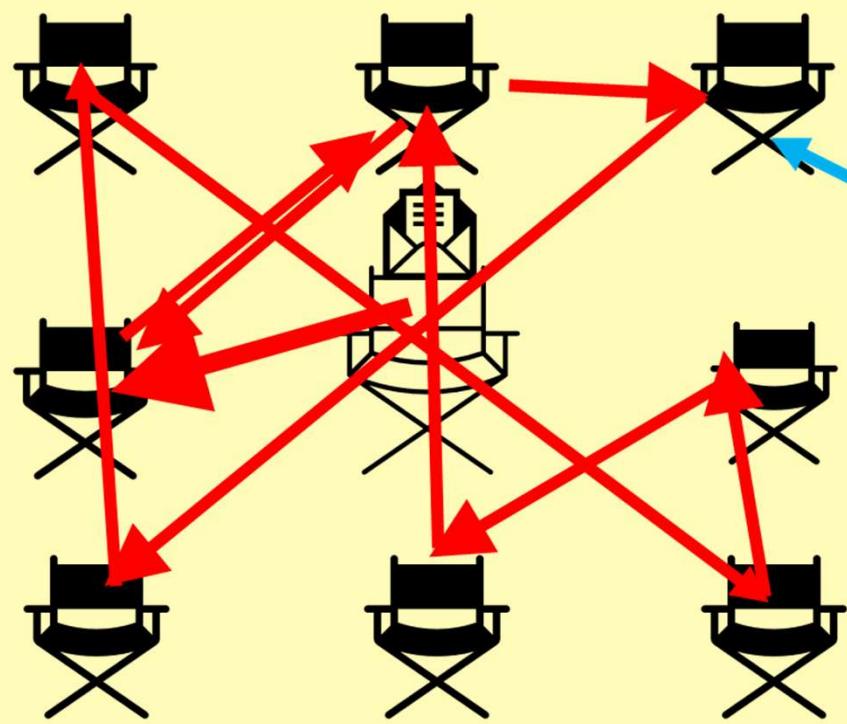
Ben Twist
Director
Culture for Climate Scotland

2026 Flood Resilience Conference
28 January 2026









For online attendees only: please go to
<https://bit.ly/4jKICwL>



Thank you. Do please contact us if we can help you.

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Director
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07931 553872
+44 (0)131 243 2760



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Reflections from the Steering Group

FLOODRE

AECOM

 AtkinsRéalis

Reflections and close

Jo Kerr
Verture

The 2025/26 steering group:

Sadiyah Rehman (Scottish Government)

Ruth Flower (SEPA)

Grant Vanson (Edinburgh and Lothians Strategic Drainage Partnership)

Shona Sloan (Scottish Flood Forum)

John Wright (Mott MacDonald)

Pippa Lawton-Van Kuijk (RPA Ltd)

Ben Cooper (City of Edinburgh Council)

Will Burnish (Moray Council)

Susan Veitch (The Highland Council).

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Conference evaluation survey:

<https://www.surveymonkey.com/r/67QSKT5>

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Thank you and safe home

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