Getting the most out of Dynamic Coast resources & SEPA coastal flood maps

Technical CPD session for new and experienced practitioners

Host:
Cat Payne

Job title:
Senior Climate Resilience Manager

Date:
27 February 2025

verture

Housekeeping

This webinar is being recorded

- Mute your mic unless asking a question
- If you don't wish to appear on the recording, please turn your camera off now
- Presentations & immediate points of clarification after each presenter will be recorded
- The extended discussion session will not be recorded and shared online
- To share your name and organisation, check your display name settings:
- To use closed captions, click on the 3 dots, select the 'Turn on live captions' option

How do I change my display name on Teams calls?

Open Teams, tap your profile picture in the top-left corner, and tap your display name.

1. Tap your display name to edit it. Alternatively, tap Edit on your profile picture and select Edit name.
2. Enter your preferred display name and tap Save.

Welcome

- Verture is delighted to host this webinar on behalf of the Scottish Government
- Learning intentions:
  - provide a solid grounding (for new users) or a refresher for existing users
  - to allow you to get the most out of Dynamic Coast and SEPA data resources
  - to inform climate-ready decision making at the coast

Scottish Government
Riaghaltas na h-Alba
gov.scot

SEPA
Scottish Environment Protection Agency

Dynamic Coast
DynamicCoast.com
@DynamicCoasts

Who is Verture?

- We're a sustainability charity based in Edinburgh and were formerly known as Sniffer
- Verture connects communities, practitioners, policy makers and researchers to share learning to help Scotland thrive despite the changing climate
- Best known for our programmes:
  - Adaptation Scotland
  - Flood Resilience Knowledge Exchange
  - Climate Ready Clyde
  - Climate Ready South East Scotland
  - Highland Adapts

We use the power of collaboration to grow flourishing futures for all in a changing climate

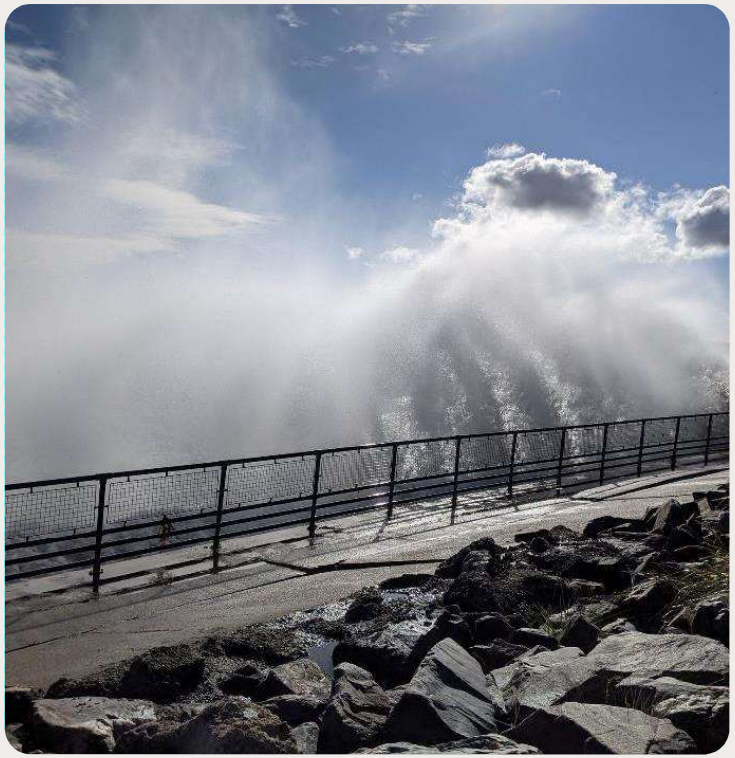
www.verture.org.uk

Agenda

1230	Welcome & overview	Cat Payne, Verture
1245	Dynamic Coast Resources	Dr Alistair Rennie, NatureScot
1325	Immediate Questions / points of clarification	
1330	SEPA Coastal flooding resources	Steve MacFarland, SEPA
1350	Immediate Questions / points of clarification	
1355	Producing a CCAP	Steve MacFarland, SEPA
1400	Extended Q&A	
1430	Close	

Ground rules

These webinars provide a safe space for discussion and sharing learning



- If you have a question please type it in the chat, or raise your hand
- There are no daft questions
- Don’t talk over others
- Mute your mic if not asking a question
- Introduce yourself and your organisation when you speak
- After each presentation there will be a few minutes for clarification questions (these will be recorded)
- **If you have a question that requires more time, or is sensitive and / or you would not like to be attributable – raise that during the extended discussion session at the end**

Overview:
Climate change & adaptation

Cat Payne, Verture

Climate change is a ‘now’ problem

Scotland’s coast has seen significant changes in the 21st century, particularly in the 2020s

- Increasing public awareness and concern
- New approach needed to coastal management and monitoring

Mainland coast = 6,160 miles (9,913 km)

Total incl islands = 11,602 miles (18,672 km)

“We have a coastal home and … we wonder how long this home will be safe and if in the future it will be possible to get a mortgage or insurance....”

“Storms removed 2-3 feet of sand from the beach and destroyed the wheelchair boardwalk (which was only installed a few months before)... All disabled access to the beach was lost. We were devasted”

“a succession of autumn storms are causing erosion on the sea front. It’s very disturbing when you see changes happening so fast.”

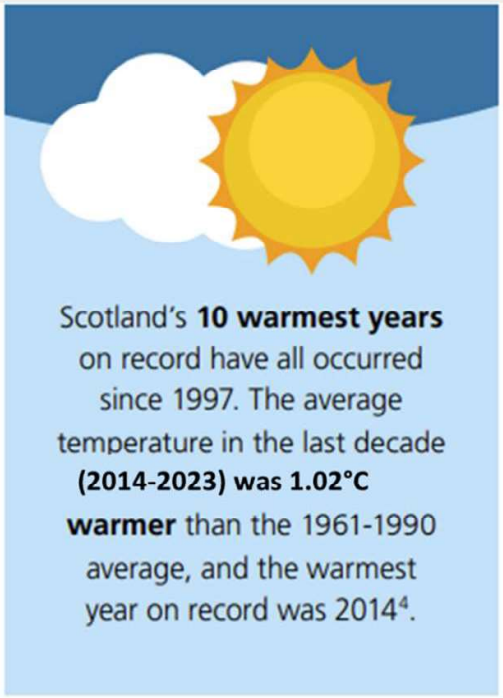
“It (the coast road) floods so bad now that the road gets shut ... Sometimes I can't get out of the village to pick up my daughter from school in the other village...”

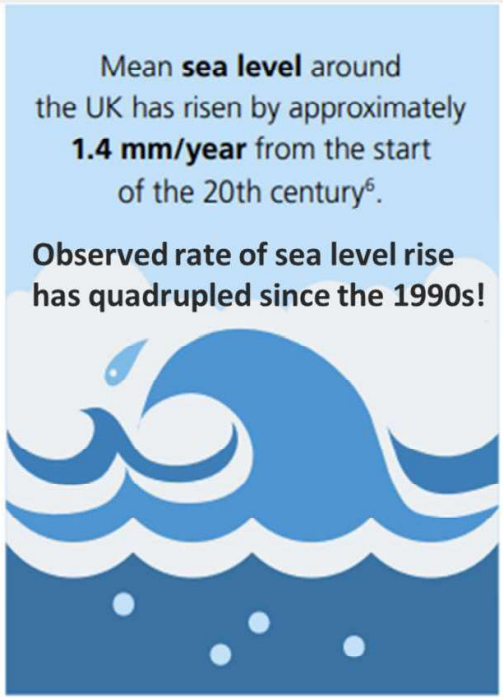
Climate Ready South East Scotland

1 of many climate risks

Can't look at coastal risks in isolation

- Adaptation should consider climate projections for all climate variables
- Climate change won't stop at 2100, SLR could continue for centuries after net zero





Resilient coastal management requires close working with:

- external partners (public, private and community sectors),

and other LA teams

- Planners,
- Climate change,
- Emergency planning,
- Risk management,
- Community engagement

Policy context

Coastal Change Adaptation Plans (CCAP)

- Clear guidance https://www.dynamiccoast.com/cca
- Funding to LAs to support CCAP development
- Funding to LAs for adaptation case studies & coastal monitoring

NPF4 sets out planning requirements at the coast.

- Nature-based solutions, presumption against new defences
- without a CCAP, LDPs are likely to fail the gate check

Scottish National Adaptation Plan (SNAP3) sets out:

- Scotland's priorities for adaptation action 2024-29.

Climate Change (Scotland) Act public bodies duties:

These duties require that a public body must, in exercising its functions, act in the way best calculated to contribute to the delivery of emissions reduction targets (known as 'mitigation'), in the way best calculated to help deliver any statutory climate change adaptation programme, and in a way that it considers is most sustainable.

CCAP guidance

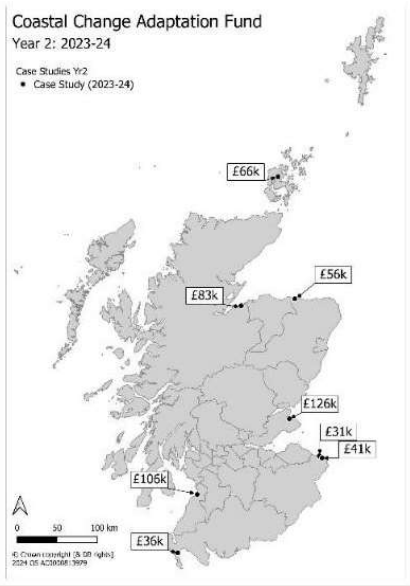
- In 2023, SG published new Coastal Change Adaptation Planning Guidance (CCAP) to assist LAs in managing the coast. https://www.dynamiccoast.com/cca
- Guidance broadly follows approach set out in DEFRA 2006 SMP guidance / refresh, but goes further:
  - promotes a dynamic adaptive pathways approach
  - centres community interests, empowerment and early engagement,
  - considers various options to adapt in response to how quickly the landscape is changing and triggers for changing course,
  - widens the scope of strategic planning beyond the 'shoreline' to include the hinterland and allow space for relocation
  - CCAP is integrated with wider LA adaptation planning. Key part of LDP evidence report for coastal LAs

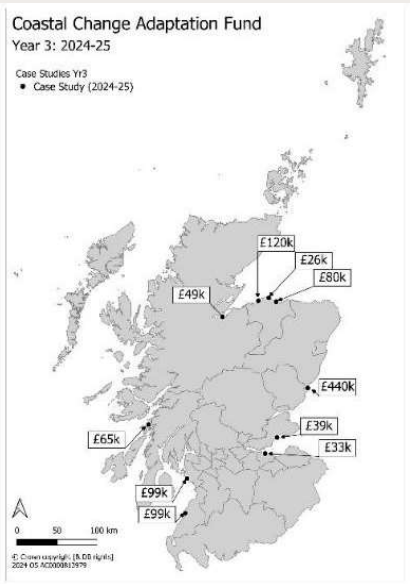
Iterative and responsive. Planned to be reviewed and updated after 2 years 'in the wild' to take account of users' experience

Developed collaboratively by CCAG (Coastal change advisory group) including SG, LAs, NatureScot, SEPA, Dynamic Coast and Verture

CCAF funding

Year	Funding	Distribution
2022-23	£1.6m	• £1.6m direct distribution to 10 LAs with the highest risk profile
2023-24	£2.6m	• £1.85m direct distribution to 14 LAs • £0.55m distributed to LAs for case studies • 8 applications funded from 7 authorities, totalling £545k.
2024-25	£2.7m	• £1.65m direct to 19 LAs • £1.05m available for case studies • 10 applications funded from 8 authorities, totalling £1.05m.
2025-26	£5.0m	• £2.5m direct to 19 LAs • £1.5m available for case studies • £1m available for coastal monitoring • Received applications which totalled almost twice the nominal budget • Currently in discussions with LAs and a recommendation of which projects should be funded will be sent to Ministers





Case study funding

- UK CCC critical of Scottish Government and LAs stating '*adaptation has stalled*'
- CCA Fund directly addresses this: funds coastal adaptation planning and resilience actions that can be undertaken immediately
- Case studies could include:
  - restoration of natural coastal defences (e.g. sand dunes or salt marsh),
  - purchase of fall-back land,
  - development of adaptation options on urban shore, and
  - community consultation
- **Case Study fund** supports innovative action **"learning by doing"** (development of CCAP supported by direct distribution)

Fund supports iterative, adaptive nature-based approaches:

- Managed retreat
- Implementing difficult decisions
- Biodiversity & carbon benefits
- Transformative change

CCAF Case Studies

Scottish Government approach recognises that this is an unprecedented challenge and we must get good at coastal adaptation fast

- Not everything we will try will work, but we can learn from it regardless
- All case studies required to share knowledge to ‘pass on the baton’ and ensure others can learn from their work, by:
  - Providing brief progress reports (templates are provided)
  - Monitor progress (incl. on the ground monitoring of physical interventions)
  - Producing a case study to showcase learning online
  - Joining and participating in Knowledge Exchange via Knowledge Hub

To see case studies from previously funded CCAF projects visit: https://www.dynamiccoast.com/cca

Other useful resources

To support informed decision making

Adaptation Scotland

Adaptation Scotland programme provides advice and support to help Scotland be prepared and resilient to the effects of climate change

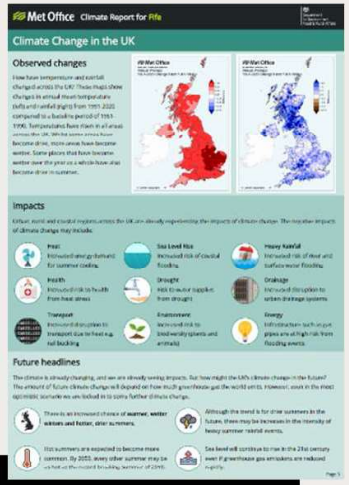
- Helps public sector, businesses and communities to understand what climate change will mean across Scotland, and
- identify the best way for them to plan for the impacts - taking the opportunities and preparing for the risks.

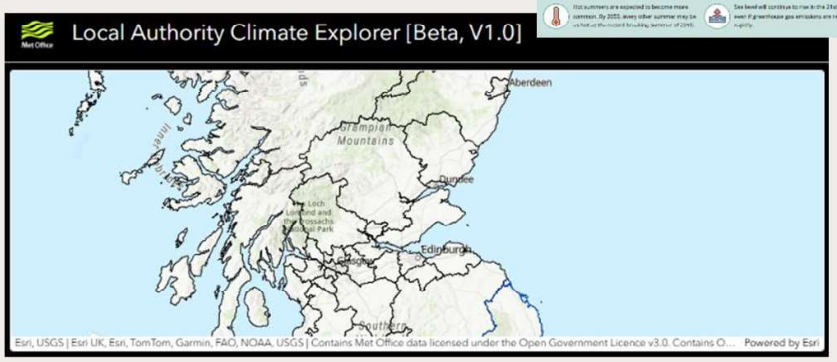
Wide range of resources available at https://adaptation.scot/take-action/

Local Authority Climate Service (LACS)

The Met Office's LACS (launched October 2024) provides resources that have been specifically designed for Local Authorities to:

- Better understand climate change in a local area, and
- Support evidence-based adaptation action
- User friendly way to access climate projection data and produce accessible, graphic climate reports
- Not just for Local Authorities - free and available for all.
- Beta service and will be developed further.



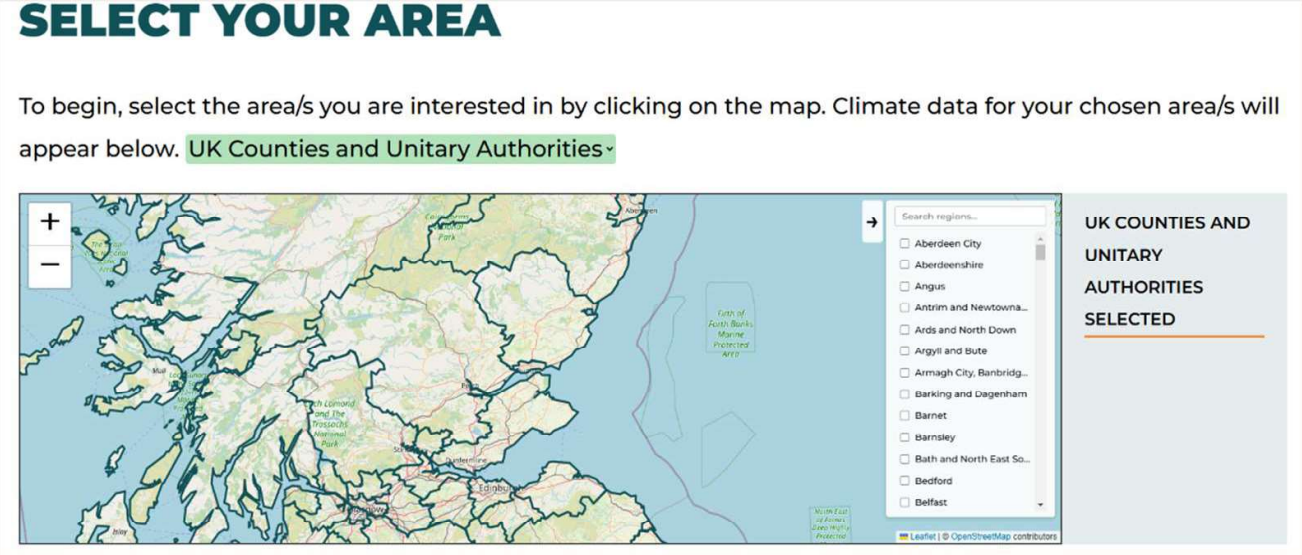


https://climatedataportal.metoffice.gov.uk/pages/lacs

Local Climate Adaptation Tool (LCAT)

LCAT is evidence-based web-based mapping platform that allows users to explore what the latest science says about:

- How local climates will change
- What health and community impacts may occur as a result
- Who will be most vulnerable and why
- Which adaptations to consider



https://lcat.uk/

Regional climate risk assessments

ClimateReadyClyde

Climate Ready South East Scotland

Highland Adapts

CLIMATE HEBRIDES

Aberdeen Adapts | Climate Ready Aberdeenshire

Climate Ready Tayside

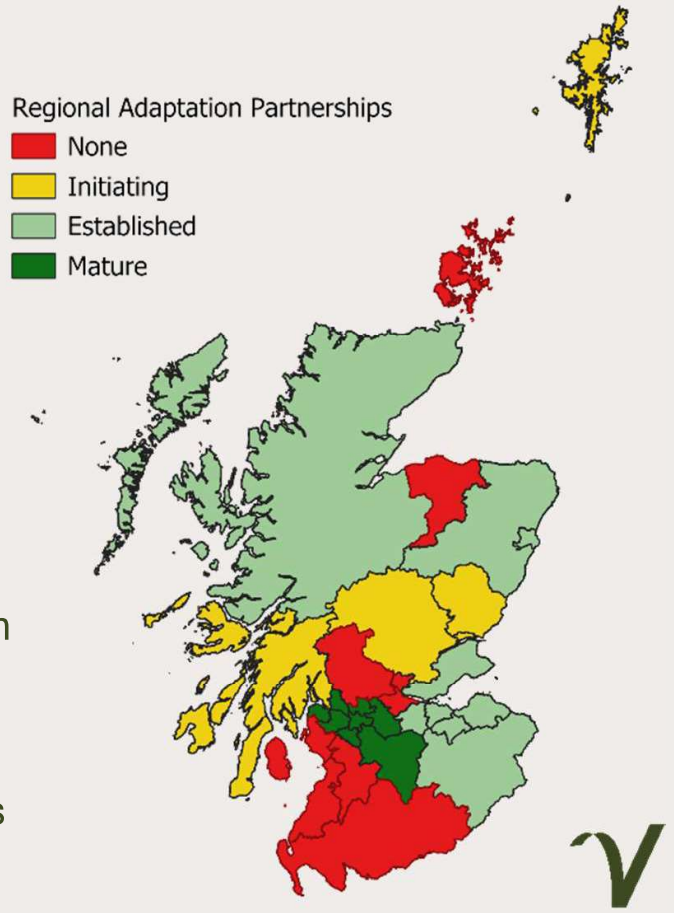
Argyll & Bute Climate Action

Shetland Adapts

SNAP3 requires all of Scotland to be covered by regional adaptation partnerships by 2029

- Regional partnerships have
  - completed or are working toward regional climate change risk and opportunity assessments, and
  - Identified priorities for regional collaboration

Regional risk assessments are excellent sources of data about risks, value at stake and interconnections between different climate hazards



Coastal change webinars

- Verture has hosted a series of coastal change knowledge exchange webinars since 2022
- Working with SG, SEPA, NatureScot and Dynamic Coast to upskill those tasked with managing Scotland's coasts featuring:
  - Latest science, policy developments, case study results, funding calls, knowledge sharing from extreme events
- Collegiate, open, peer to peer learning
  - Time and safe space for discussion (not recorded)
- Previously focussed on coastal management practitioners, but audience getting broader
  - Latest sessions target elected members and planners

Watch recordings on Verture's Coastal Change Vimeo showcase
https://vimeo.com/showcase/11140183

Thank you

Cat Payne
cat@verture.org.uk

Dynamic Coast Mapping Resources

Intro & update

27th Feb 2025

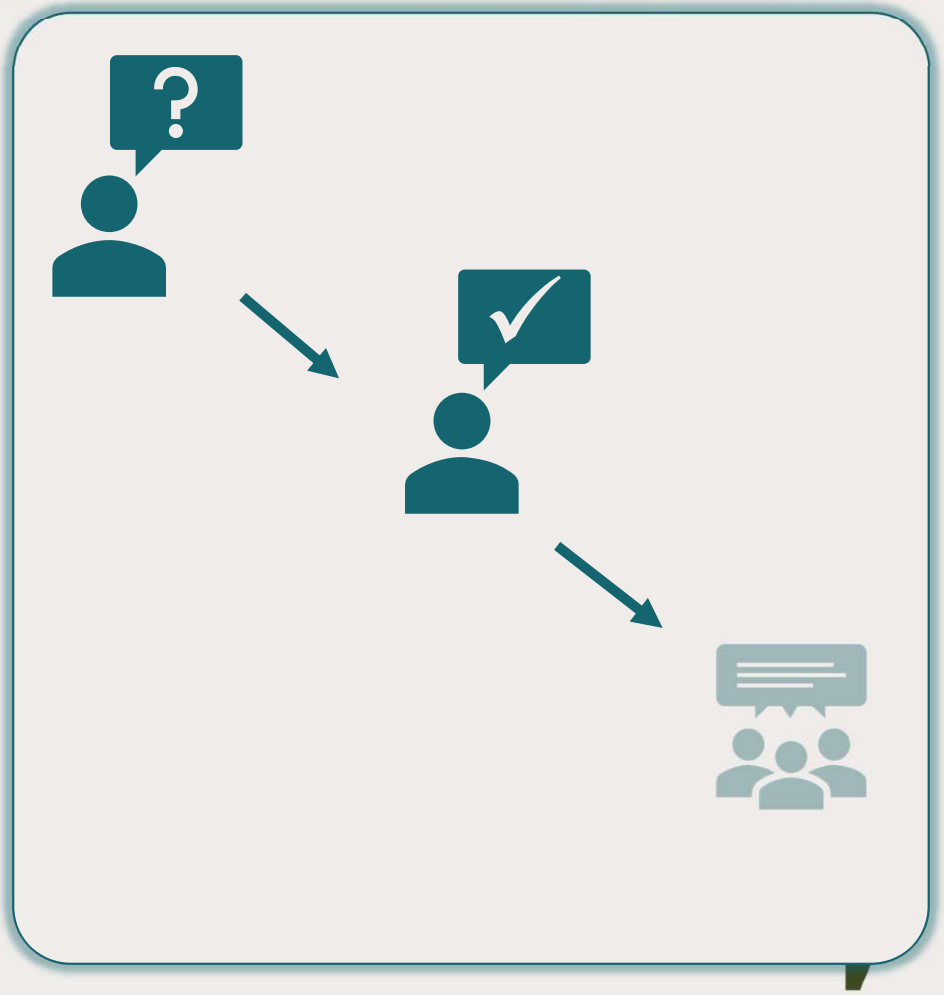
DynamicCoast.com
Alistair.Rennie@nature.scot
DynamicCoast@nature.scot
@DynamicCoasts

Desired outcome

Dynamic Coast
DynamicCoast.com @DynamicCoasts

By the end of the discussion, we hope you'll:

- Better understand the range of DC's webmaps
- Better understand the other resources
- Better understand how to access GIS data
- Better understand how to interpret the data
- Be able to undertake Coastal Change Adaptation work in your area.



Webmaps

Dynamic Coast
DynamicCoast.com @DynamicCoasts

You can find them here:

DynamicCoast.com/webmaps

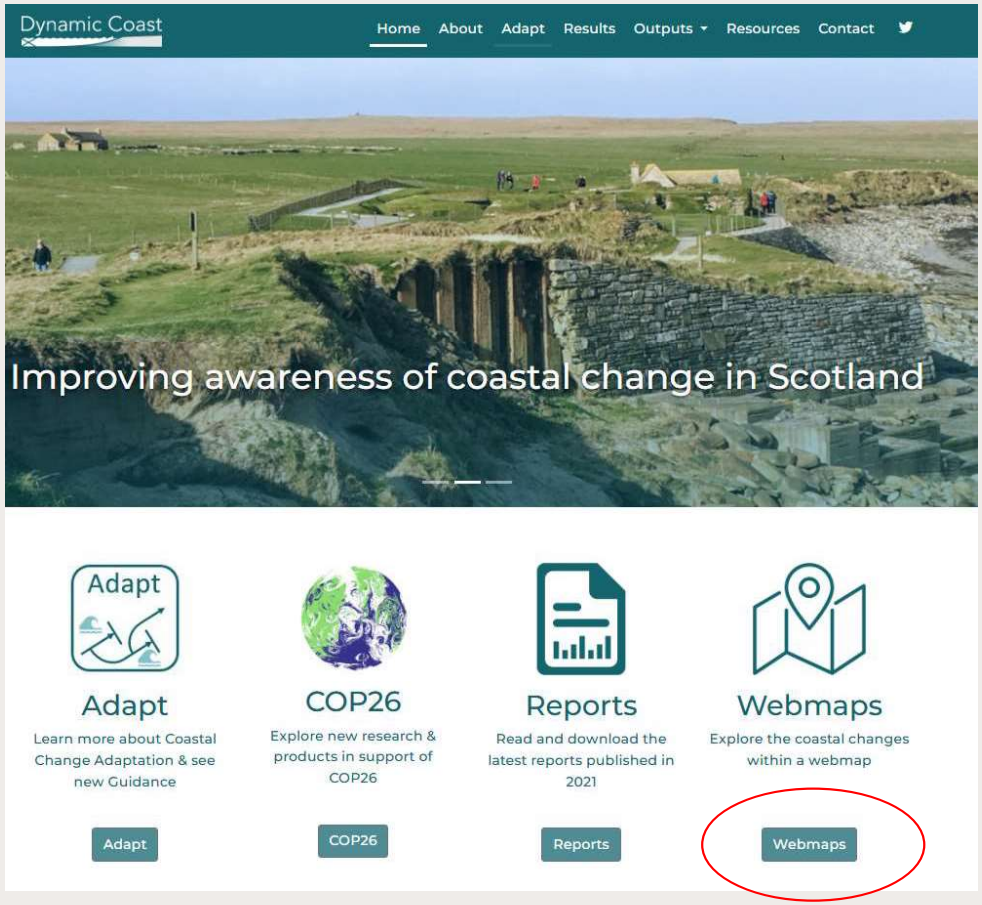
But you'll also see our other resources:

Adaptation page.

COP26 summary

Reports

.. Note other links at the top.



Webmaps

Dynamic Coast
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There are a range of maps including:

- Basic
- Advanced
- Compare Emissions Scenario
- Coast X-Ray
- LiDAR availability
- Erosion Disadvantage
- Erosion Reporter

View on website (demo all)

Things to remember

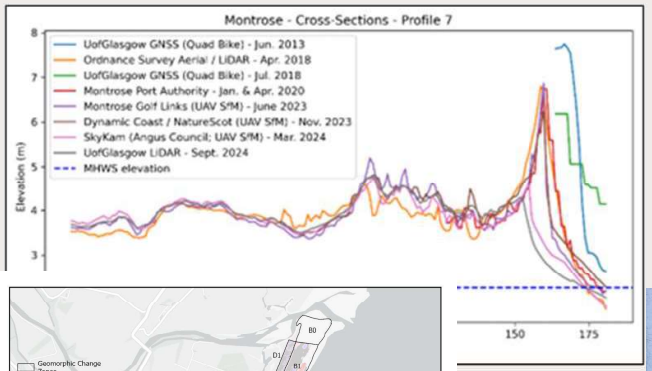
Dynamic Coast
DynamicCoast.com @DynamicCoasts

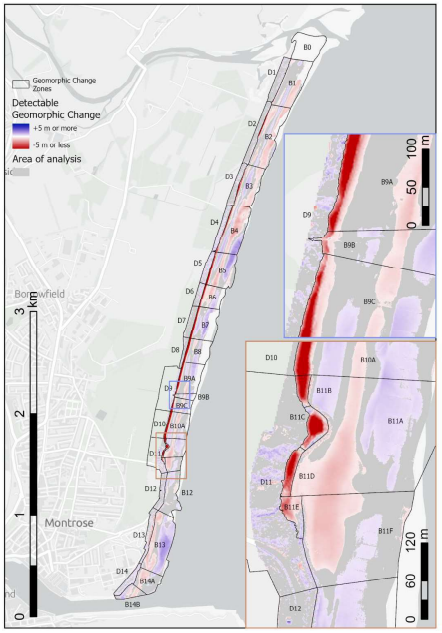
- Maps published in 2021
  - Change since 2020 hasn't been included.
- Soft open coast
  - beaches have been modelled.
  - Salt marsh, cliffs & artificial defences not modelled.
  - No mapped erosion = no risk
- Maps show modelled shorelines
  - We have computers, not crystal balls, projections are indicative.
  - Projections are based on snap-shots (thus alternative pasts & futures are available).
  - If you have different, more detailed, or more recent data, we'll get different projections.

Things to remember

Dynamic Coast
DynamicCoast.com @DynamicCoasts

- These are national / regional-level assessments. They should not be used for property-level assessments.
- Storms impacts are inherently complex.
  - Projections show average rates of change (m/yr), not individual storm impacts (m/hr).
- Coastal change is location & context specific: is 1m/yr important to you?
- There are inherent limitations in any (national / regional) assessment.
  - If you need to know more, please commission further investigations and analysis. Let us know and we can share it.





Source: Angus Council, UoG & DC

Webmaps - demonstration

Dynamic Coast
DynamicCoast.com @DynamicCoasts

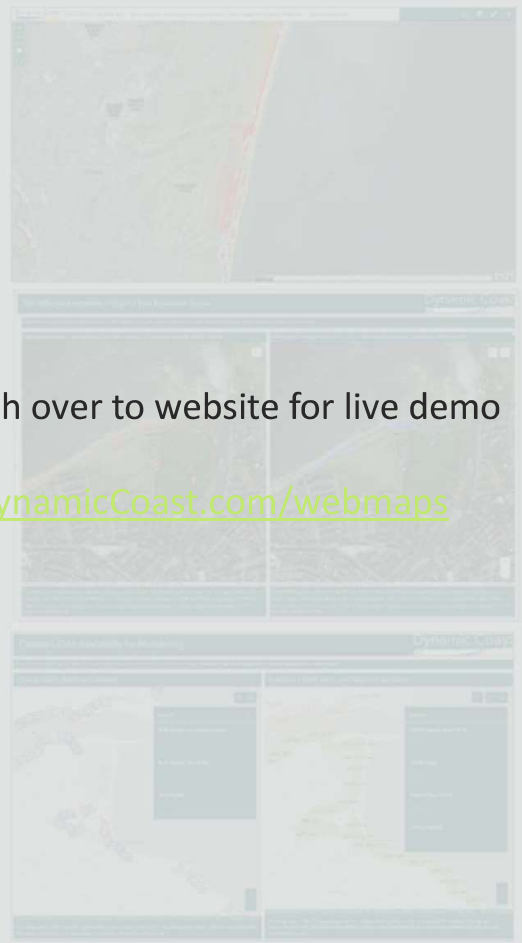
There are a range of maps including:

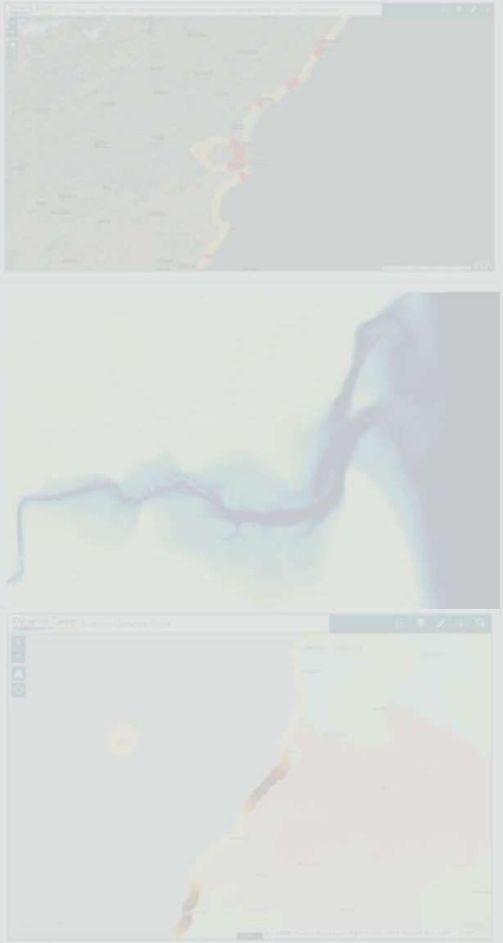
- Basic (we'll come back to this)
- Advanced
- Compare Emissions Scenario
- Coast X-Ray
- LiDAR availability
- Erosion Disadvantage
- Erosion Reporter

View on website (demo all)

Switch over to website for live demo

DynamicCoast.com/webmaps





GIS data & downloads

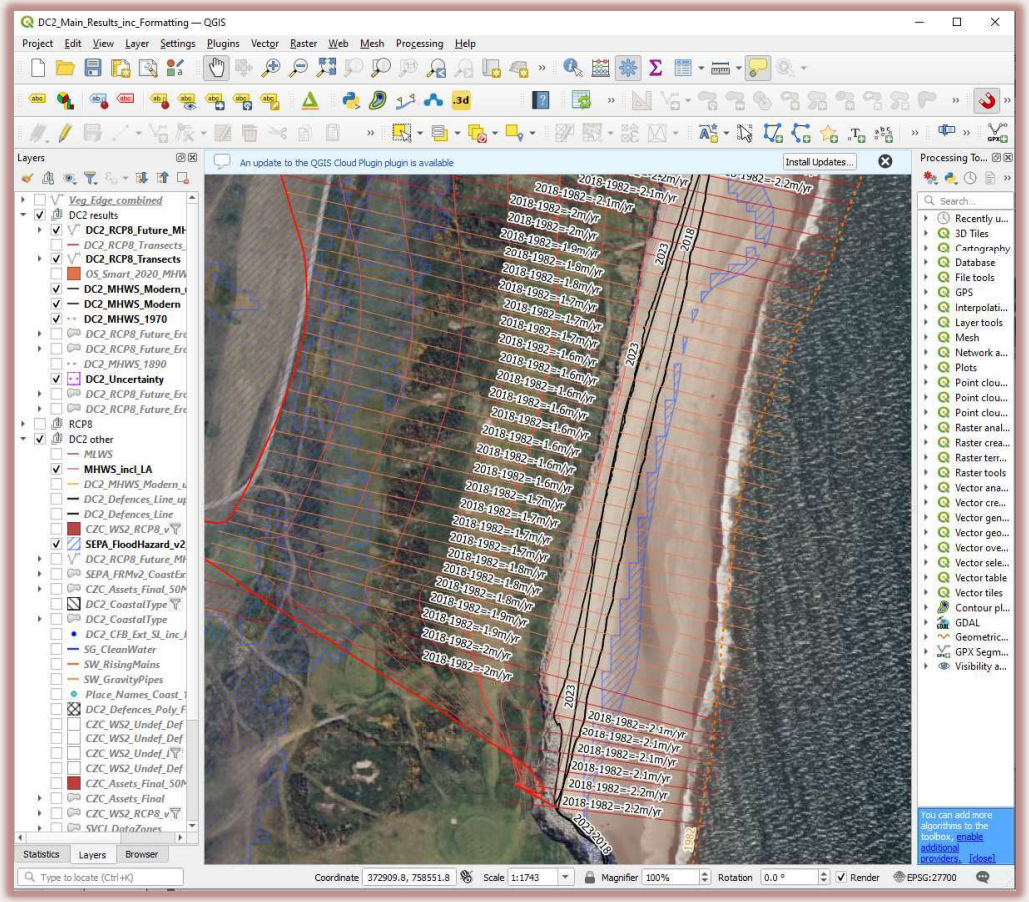
Dynamic Coast
DynamicCoast.com @DynamicCoasts

Webmaps provide easy access to key datasets.

To answer more complex questions, you can use a GIS to explore and query the data.

Core GIS data available for download, and is visible on

- ESRI ArcMap / ArcPro
- QGIS (free)



Downloads

Dynamic Coast
DynamicCoast.com @DynamicCoasts

Dynamic Coast's key results are freely available for download (Open Government License).

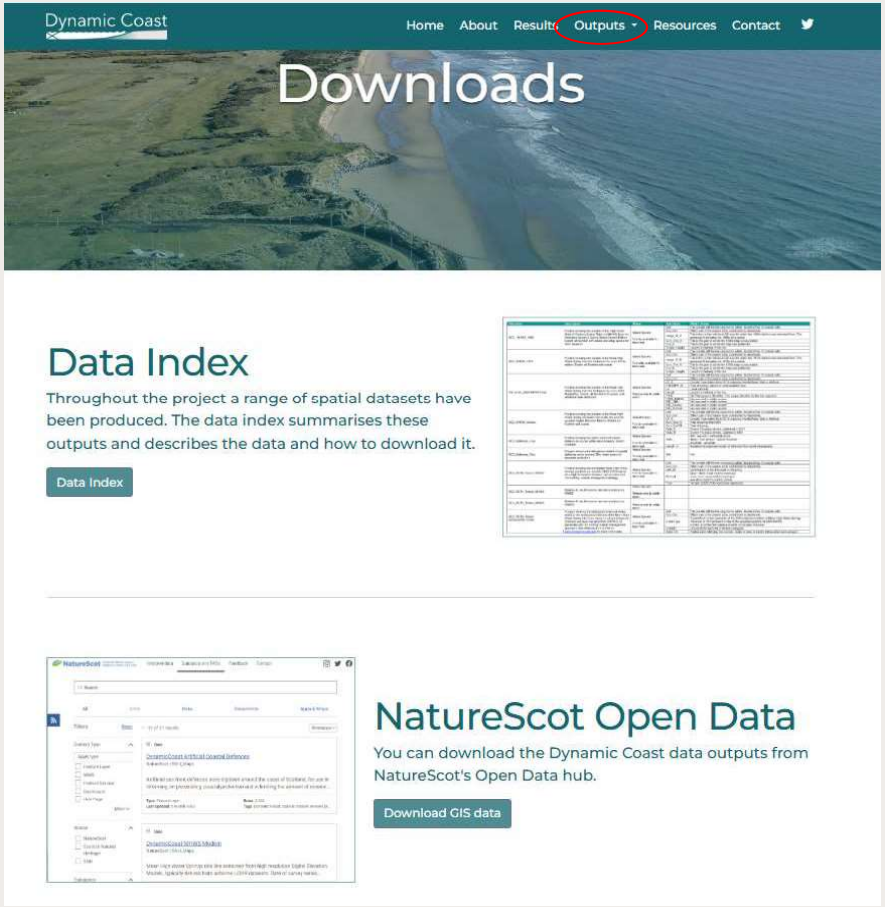
Look under 'Outputs'.

1. Data Index
2. Link to Open Data

Any issues please email

data_supply@nature.scot &

Dynamic.Coast@nature.scot



Additional Data

Dynamic Coast
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Backdrop mapping:

OS ZoomStack, Open Street Map

Aerials: APGB, Bing, Google

Context

LA boundaries

Protected sites (cultural & nature)

Assets

Residential Property, Road, Rail etc

LA data on assets (defences etc)

Infrastructure (water etc)

Additional DC data:

Coastal segments 1km2

Veg Edge lines

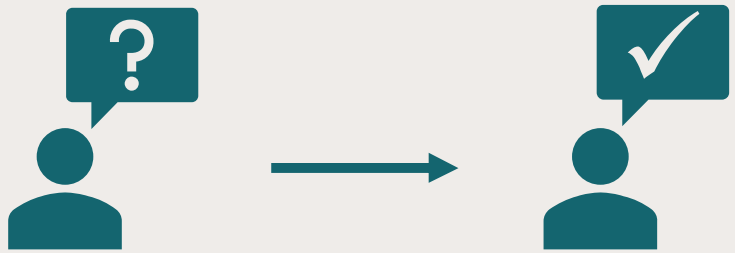
Survey data?

Drone imagery?

Points of Clarification

Dynamic Coast
DynamicCoast.com @DynamicCoasts

Many thanks.
I'm happy to take points of clarification before the recording ends. ☺



Scottish Environment Protection Agency
Buidheann Dìon Àrainneachd na h-Alba

For the future of our environment

SEPA Coastal Flood Hazard Maps

Acknowledge input from JBA, HR Wallingford, RHDHV etc

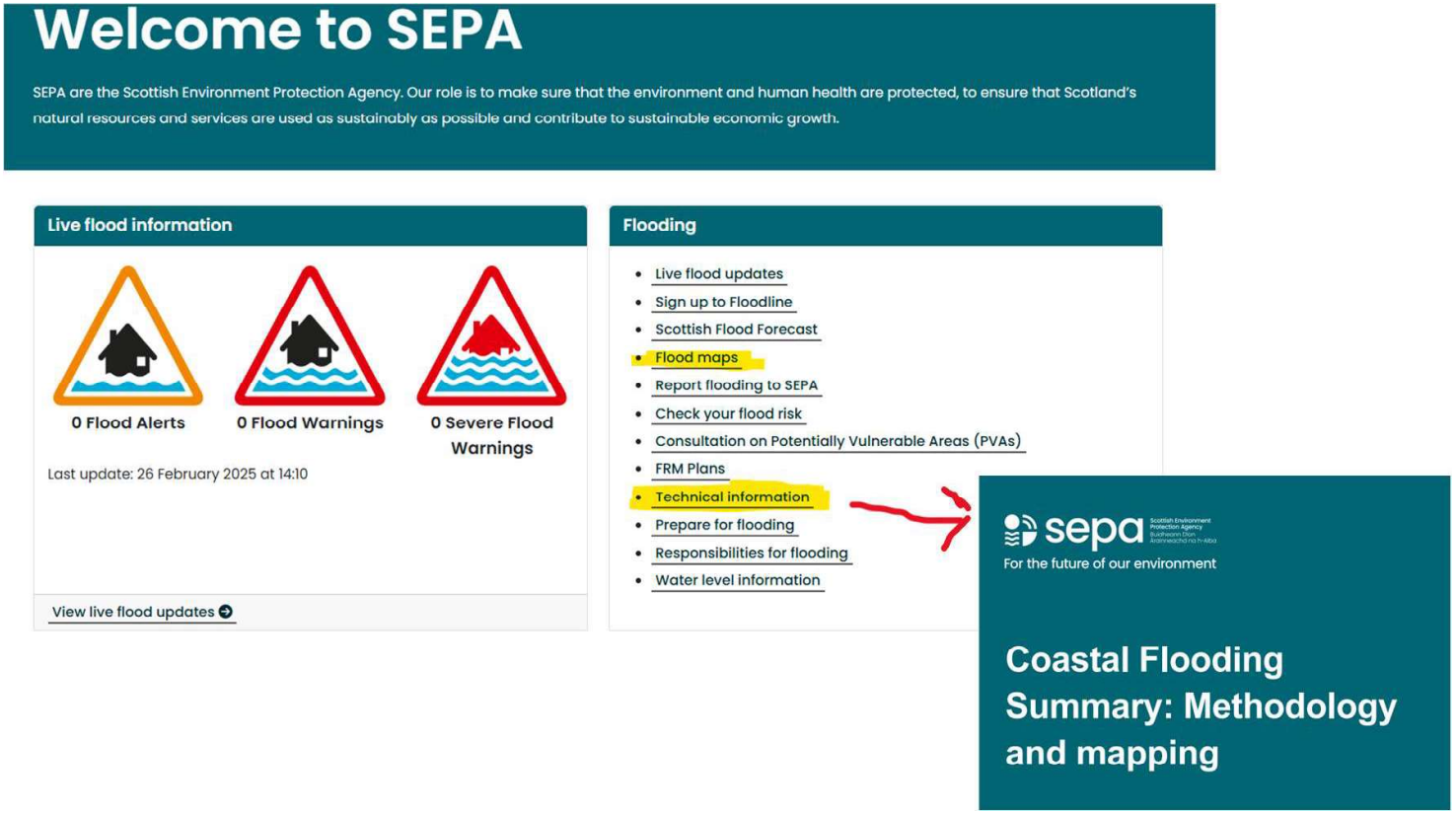
Steve McFarland

February 2025

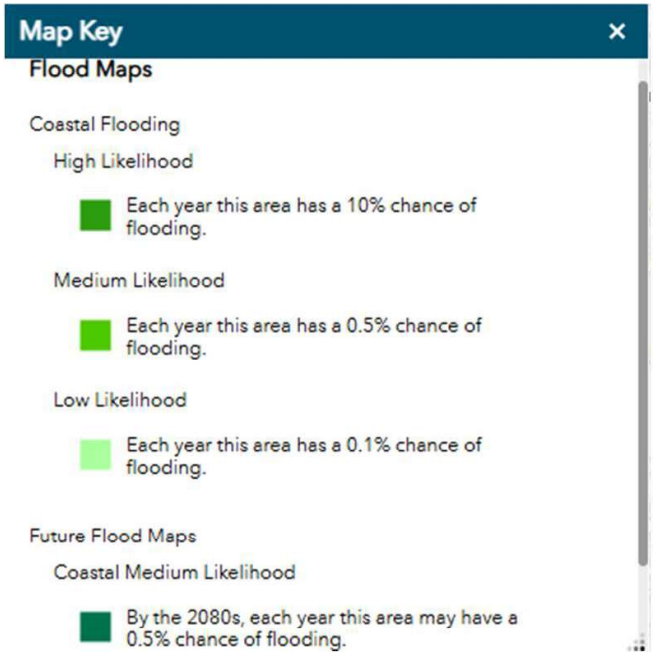
SEPA Coastal Flood Hazard Maps

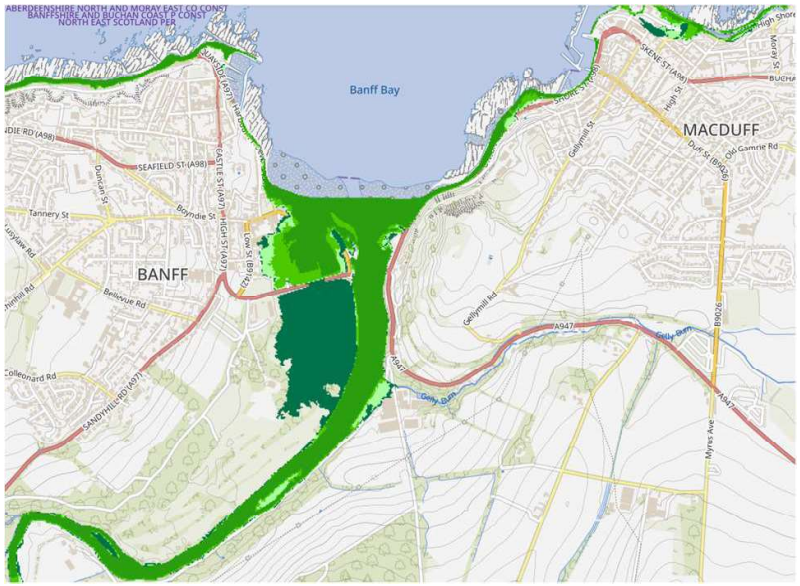
1. What have we got and where do you find them?
2. How are the coastal flood maps constructed?
3. What can they be used for?

Coastal Flood Hazard Maps, where do you find them?



Coastal Flood Hazard Maps, what you will see





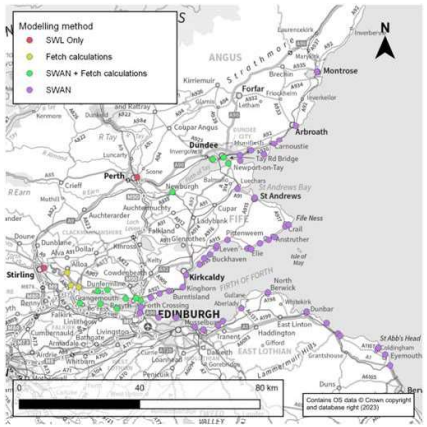
Coastal Flood Hazard Maps - How are they constructed?

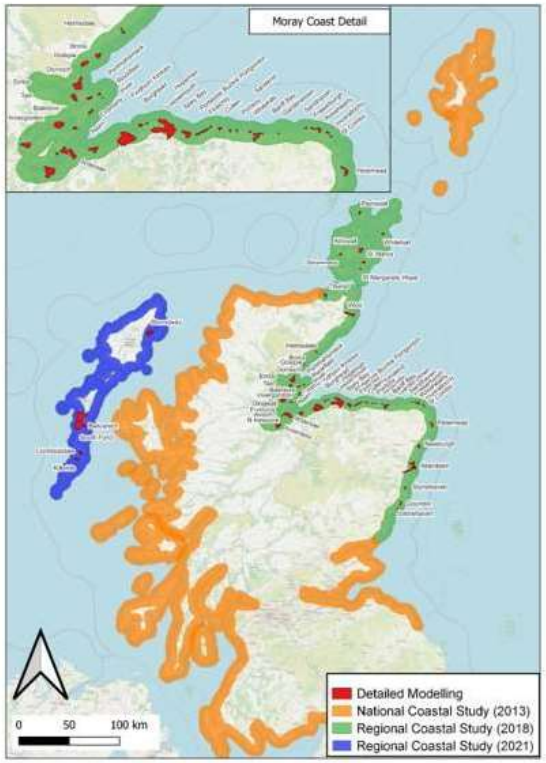
Base Product – National Coastal 2013 (Orange)

Regional Updates (Green and Blue), include more detailed local modelling (Red) November 2023

Local Updates

Southeast Scotland Regional update underway



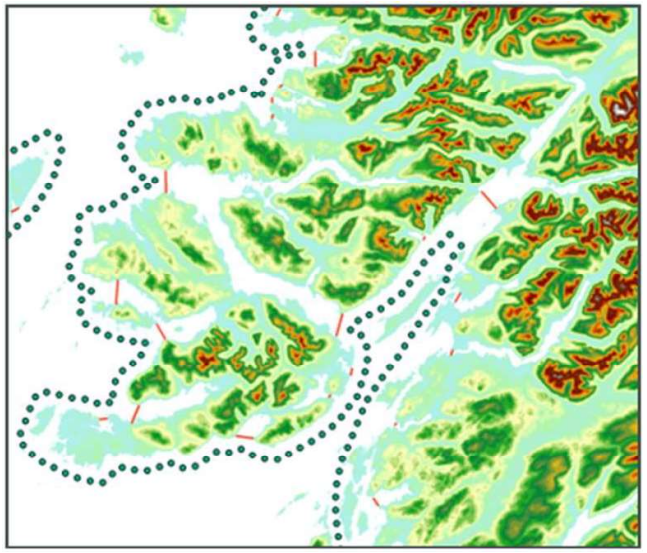


Base product based on Coastal Flood Boundary dataset (extreme sea levels) and a topographical model

CFB dataset (2011) contains a range of extreme sea levels around the UK coast at 2 km intervals

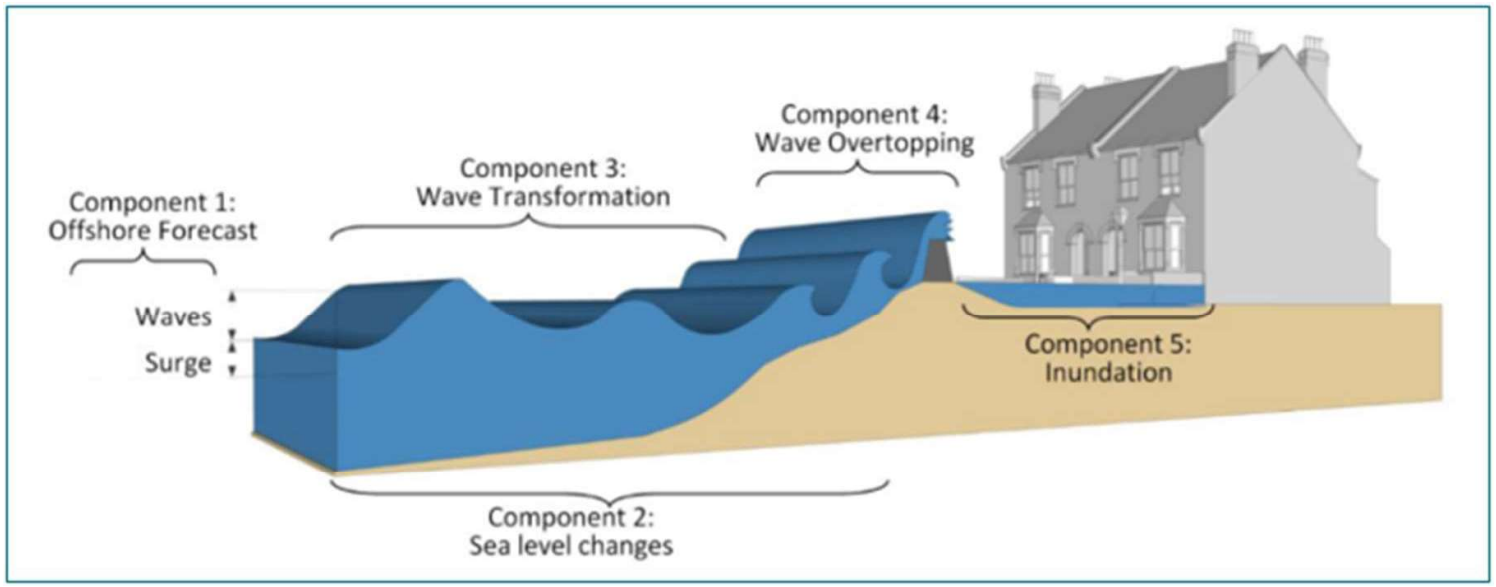
The extreme sea levels are projected over the adjacent land and are compared with the local ground levels

Where extreme level projected is above ground level – it floods, the difference being the depth of flooding



Regional Updates

(include CFB updates and where appropriate waves



Regional Updates

Simplified Mapping

•Projection of extreme sea level estimates

•Developed from CFB data only (no wave exposure)

•Inclusion of wave setup and runup (wave exposed coasts)

Detailed Mapping

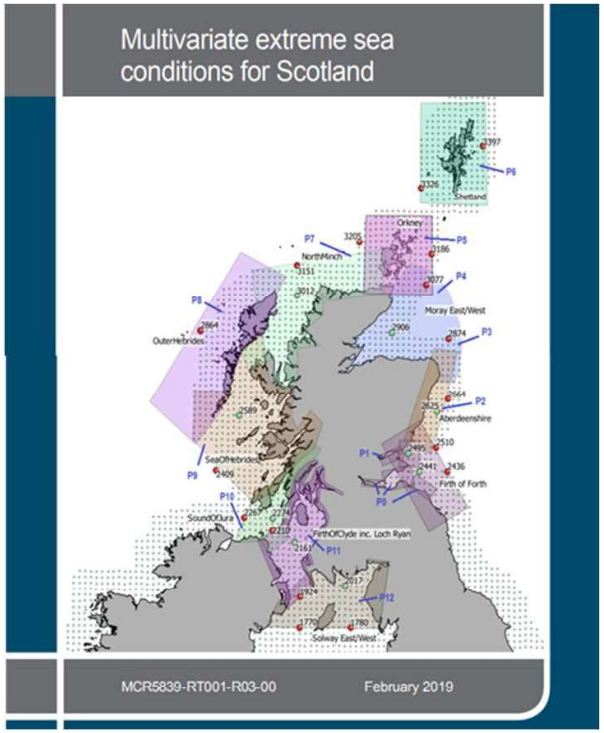
•Developed by high resolution TUFLOW modelling

•Inclusion of wave transformation and overtopping

Regional Updates detailed modelling

Offshore Datasets

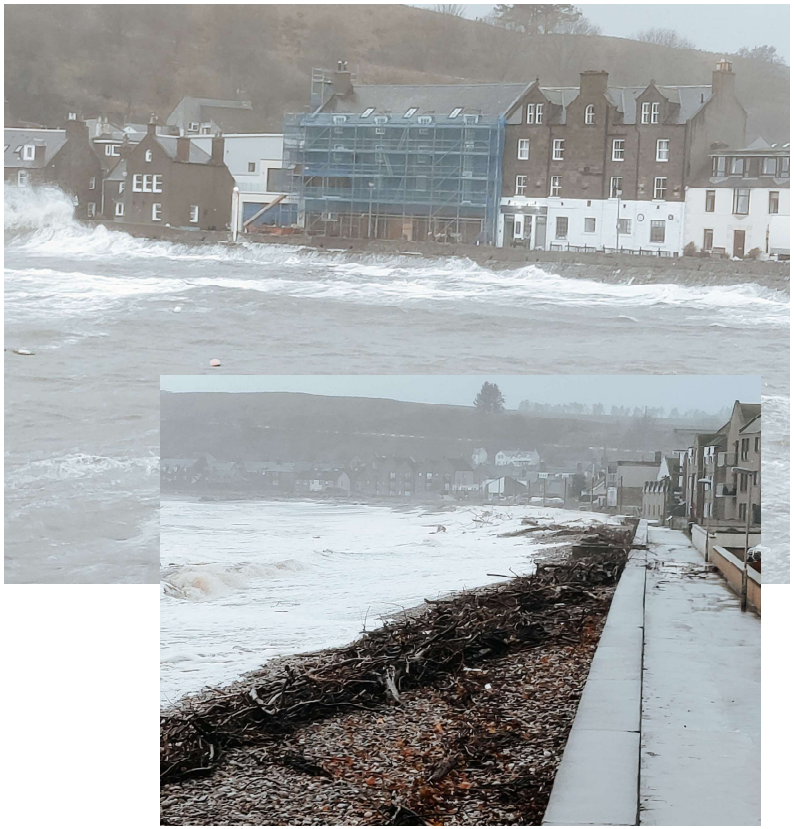
- MV data for 17 offshore locations
- Each dataset equivalent to 10,000 years and wave and sea level data
- Variables include:
  - Significant wave height (Hs)
  - Wave steepness (based on T_{m-10})
  - Wave direction (θ)
  - Directional spreading parameter
  - Wind speed (U)
  - Wind direction (θ_u)
  - Water level.



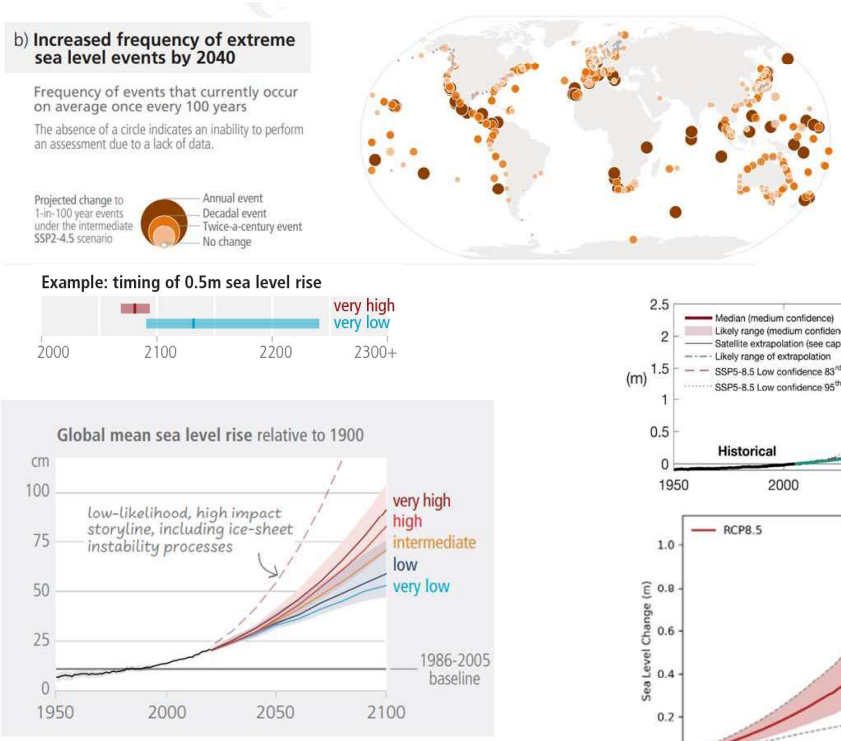
Regional Updates detailed modelling process

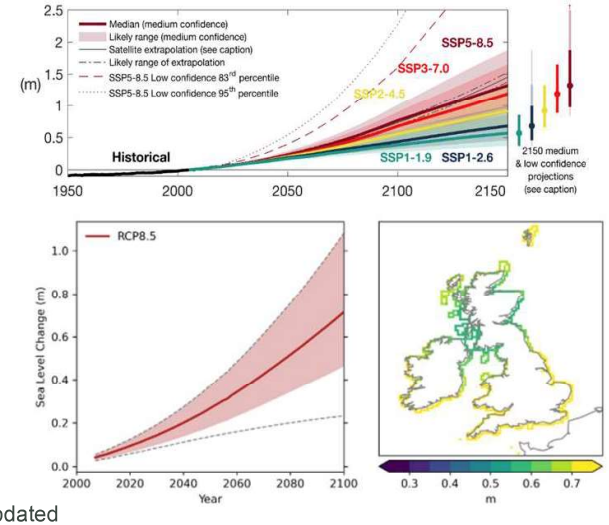
1. *Swan 2d wave models and parametric model to bring waves inshore*
2. *Wave overtopping modelling (Eurotop) to obtain overtopping rates for combinations of sea level and waves – estimate return periods*
3. *Inundation modelling based on TUFLOW – distribution of flood water from overtopping and sea level over the land*

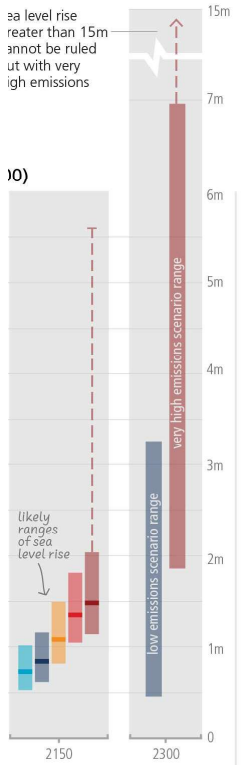
Regional Updates detailed modelling example



What about sea level rise?







Sources: IPCC 2023 Long Report, UKCP18 Marine Report Updated

What about sea level rise?

1. *Sea level has risen already by around 165mm since 1900 accelerating from long term average of around 1.5mm/yr to 3-5mm in last 30 years*
2. *Rise of at least 1m and up to 2m by 2100 is expected - SNAP3*
3. *Uncertainty is how fast that rise will be and when it stops*
4. *Many factors influence sea level rise scenarios both globally and locally*
5. *You don't need a metre sea level rise to experience significant impacts, smaller rises will have significant impacts*

What is the future scenario in our published flood map?

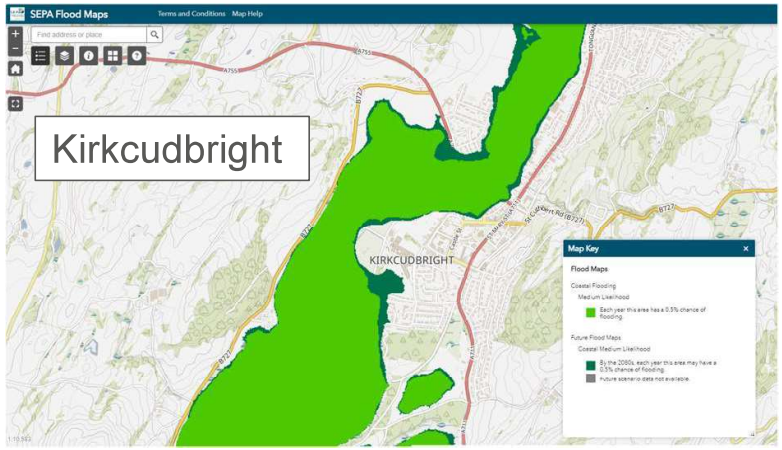
Our published flood maps contain a single future sea level rise scenario – based on 0.5% AEP – medium risk including climate change

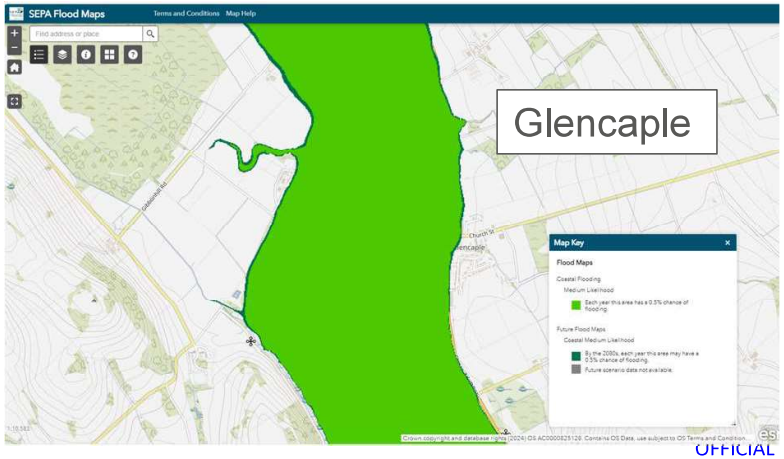
We base our scenario on the best information available at the time so the assumptions behind the published future flood maps vary based on when updates last took place

Details of what been used can be found in the "Coastal Flooding Summary" document online

Note also guidance for land use planning will differ from what's in flood maps

Sea level rise depicted on SEPA flood maps vs looking at frequency of flooding





	Occurrences of flooding	
SLR from current year	Kirkcudbright	Glencaple
0	1	2
0.1	3	4
0.2	7	9
0.3	12	18
0.4	17	26
0.5	25	38
0.6	31	56
0.7	41	84
0.8	53	109
0.9	76	151
1	100	205

*Numbers can indicate scale of increase but due to approximations used within method should not be interpreted as representative of actual future events

Clarifications / Questions on Coastal Flood Hazard Maps

Coastal Change Adaptation Plan Guidance

1. *Published on the Dynamic Coast Website by Scottish Government with input from multiple organisations*
2. *PART 1 is concerned with gathering supporting information on long term coastal change including BUT NOT LIMITED TO Dynamic Coast and SEPA flood map information and the likely impacts of those changes. Use that information to develop the long-term vision for a resilient and sustainable coast*
3. *It is not a site-specific fix*

Coastal Change Adaptation Plan Guidance

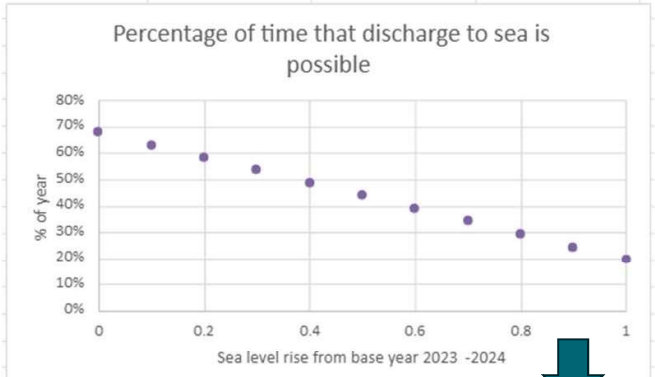
1. *Part 2 is about the process for moving from where the coast and its communities are now to where they need to be*
2. *It takes a dynamic pathways approach which can accommodate uncertainty in timescales for change / eg future sea level rise, rates of erosion or events by considering trigger points for policy change*
3. *Dynamic pathways lends itself well to planning to take opportunities as they present themselves to build resilience long term*
4. *Monitoring change against assumptions is essential to track when trigger points might be reached*
5. *UK CCC – adaptation in Scotland has stalled – urgency needed*

What does sea level rise mean for coastal flood risk? Eg Stonehaven.

Flood Study suggests 2012 severe event (approximately 0.5% - 1% AEP) becomes around 10% by end of century

What does sea level rise mean for surface water flood risk? Eg Kirkwall, Orkney Islands.

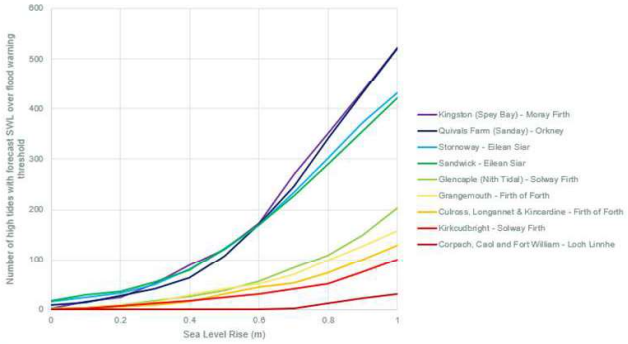
Orkney Islands Council



Sea level rise from current year (2023-2024)	Percentage of time that discharge to sea is possible	Max consecutive hours drainage	Max consecutive hours no drainage
0	68%	50	9
0.1	63%	48	10
0.2	59%	23	11
0.3	54%	11	12
0.4	49%	10	22
0.5	44%	9	47
0.6	39%	8	48
0.7	35%	8	49
0.8	29%	7	74
0.9	24%	6	123
1	20%	6	138

What does sea level rise mean for coastal change / erosion and flood risk? Eg Kingston

Figure 1.2 Change in configuration to the Mouth of the Spey 1988 - 2012.



Coastal Change Adaptation Plan Guidance

1. *Develop an understanding of the longer-term pressures and where you need to be to avoid the biggest impacts*
2. *Take action to reduce impact of floods / erosion now but mindful that a point will come where a change in policy is likely needed*
3. *Plan for that change so that opportunities can be taken to get there in a safer, more orderly and cost-effective way – plan now for future!*
4. *Be aware that small changes in sea level or erosion can have significant impacts - don't get caught out by waiting for big change*
5. *DO IT WITH THE COMMUNITIES THAT ARE AFFECTED AND START NOW*