CiFR

Cumbria innovative Flood Resilience

Cumberland Council

Westmorland & Furness Council

Working for **Cumberland Council** and **Westmorland & Furness Council**

Department for Environment Food & Rural Affairs

Environment Agency

NATURAL ENGLAND

Lancaster University

Cumbria CVS

3keel

CUMBRIA COMMUNITY FOUNDATION

What is CiFR trying to do?

- Improve the flood and climate resilience of small, rural communities
  - Many have already suffered multiple flood events
  - Traditional flood defences aren't financially viable
  - Climate change is making floods more common and more extreme

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What is CiFR trying to do?

- Build on existing work, strengths & experience within Cumbria
- Use targeted Natural Flood Management (NFM) to reduce flood risk
  - Modelling to identify appropriate locations/interventions – range of landscapes
  - Focussed interventions close to community at risk to achieve required volume
  - Multiple funding streams to ensure NFM is attractive to landowners
- Support communities to prepare for the residual flood risk
  - Better understanding of risk (now and in the future) and how to respond
- Put in place monitoring and evaluation to demonstrate effectiveness
- Help understand our Climate Change risks
- Influence national (and local) policy and practice

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Natural Flood Management at scale

- Builds on Cumbria NFM programme
- Target volume: 10,000m^3 per 1km^2
- Trialling new designs
  - Targeting the risk return period
- Monitoring effectiveness
- Evaluating options for all at risk communities (circa 200+)
- How to work within BNG & WHS constraints

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Farming and Community Officers




- Expansion of the Catchment Sensitive Farming Officer role
- Employed by Natural England
  - Trusted intermediary
  - Access to funding streams (CS, ELMs)
- Long term, joined up approach
  - Flood risk, water quality, biodiversity
  - Farm sustainability, flood & drought
  - Links with local communities

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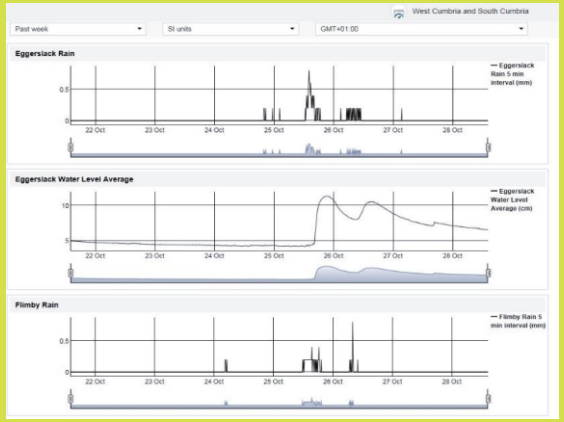
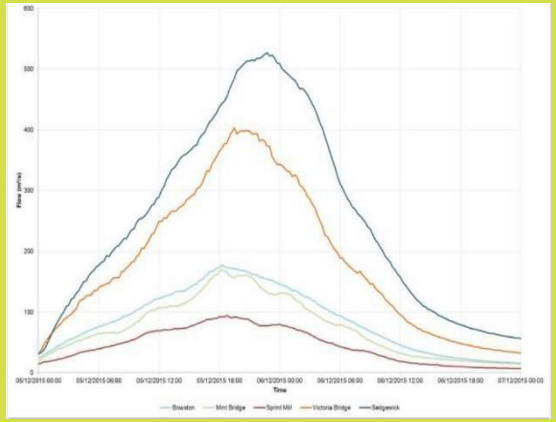
Modelling, Monitoring and Warnings





- Lead partner: Lancaster University
- Modelling to identify locations
- Monitoring before and after NFM
  - Hydrograph – every 5 minutes
  - Water quality Phosphates, Nitrogen, Carbon, cutting edge technology including live phosphate monitoring
- Data can be viewed online
  - Potential for community warnings

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Blended Finance

- NFM must be financially attractive to landowners
  - Need to stack benefits and funding streams
- Water quality/carbon benefits open up opportunities for private sector investment
- 3Keel leading, building on local LENs approach
- Potential opportunities with Nestle and UU

Community Preparedness and Resilience

- Helping communities to understand and prepare for their (flood) risks
  - Flood warning sign up
  - Community Emergency Plans
  - Training and equipment
- Building strong networks
  - Within communities (inc. landowners)
  - Between communities
  - With responders and risk management authorities
- Joining it up “at place”

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Strategic Evaluation and Dissemination




- Hydrology and water quality
  - Dr Nick Chappell
  - Lancaster University
- Valuing community resilience
  - Prof Duncan Shaw
  - Alliance Manchester Business School
- Cumbria Climate Change Risk Report
  - Nottingham Trent University
- Making innovation happen……

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How do we consider future flood risk?

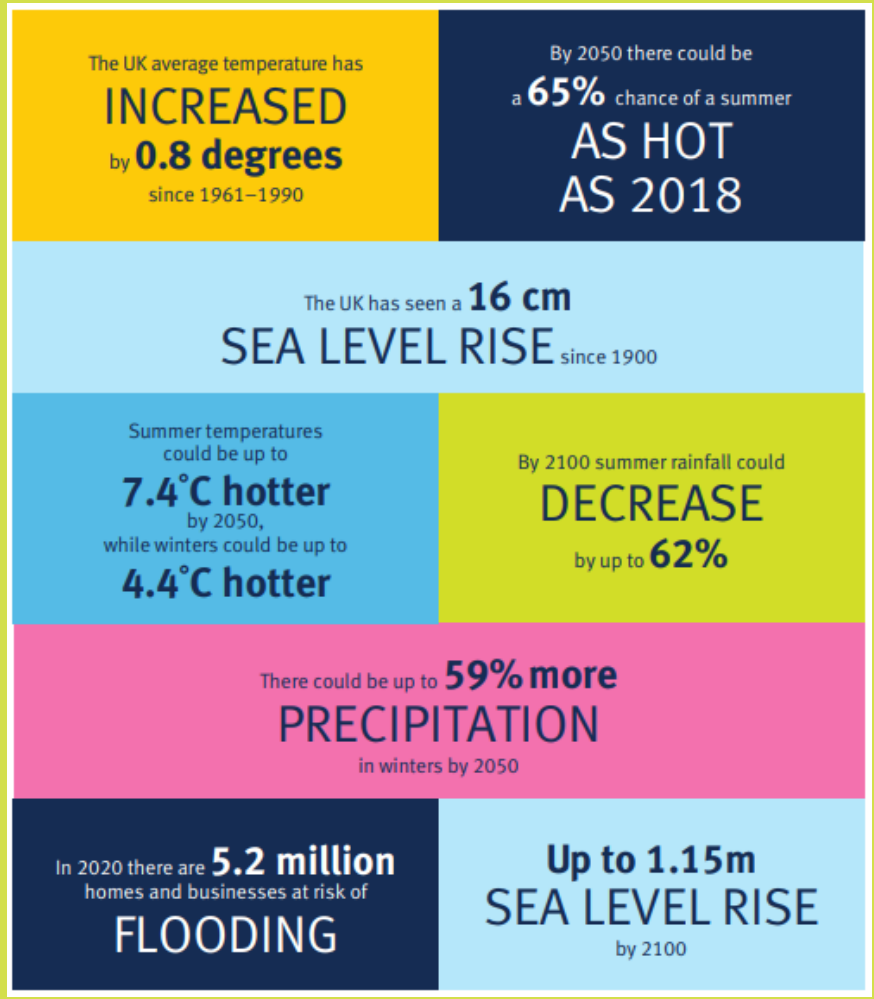
The EA uses climate change allowances to estimate future flood risk.

These allowances describe a percentage change in peak river flow, rainfall intensity and sea level rise.

The EA's climate change allowances are based on UKCP18 outputs (Met Office Hadley Centre)

Our allowances are based on a high emissions scenario (RCP 8.5)

The mid-point of this scenario represents global temperatures increasing on a trajectory towards 4°C by 2100.



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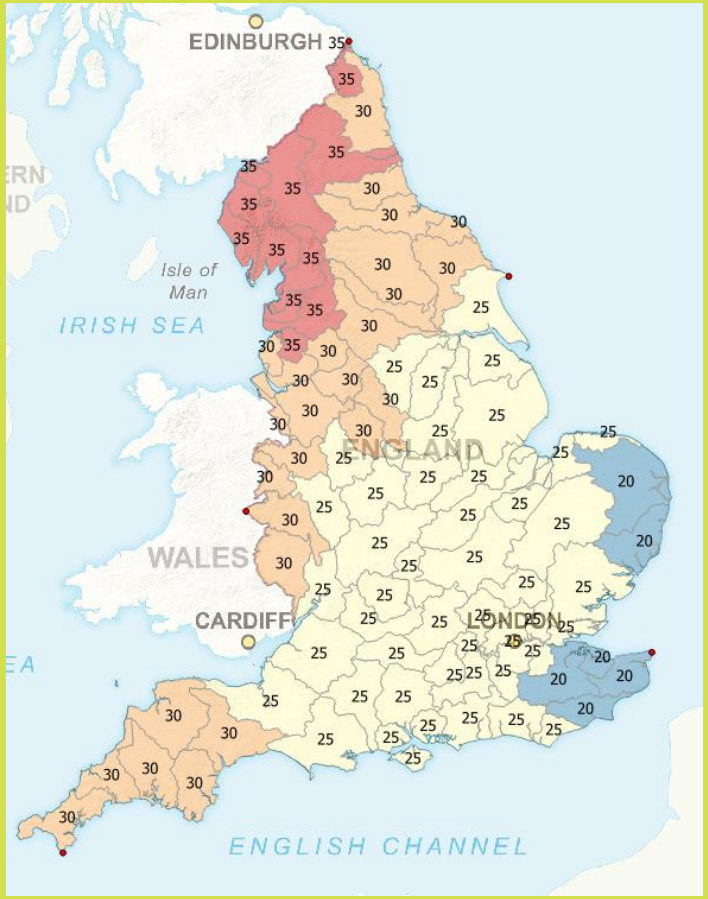
Climate change allowances for management catchments in England

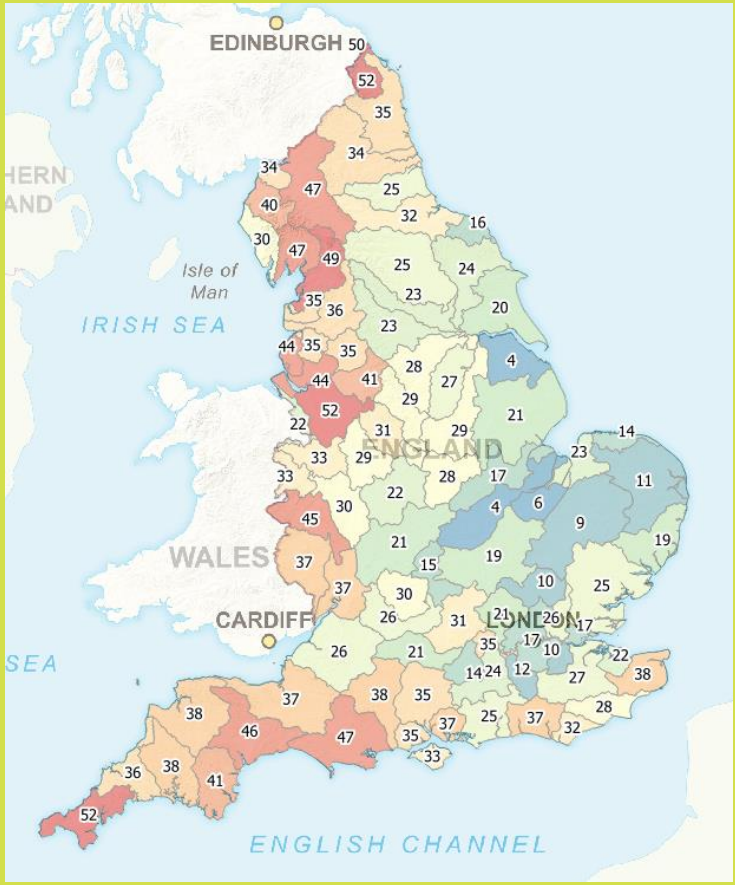
Percentage increase in peak rainfall

(Central allowance, 1% AEP, 2070's)



Percentage increase in peak river flow

(Central allowance, 2080's)



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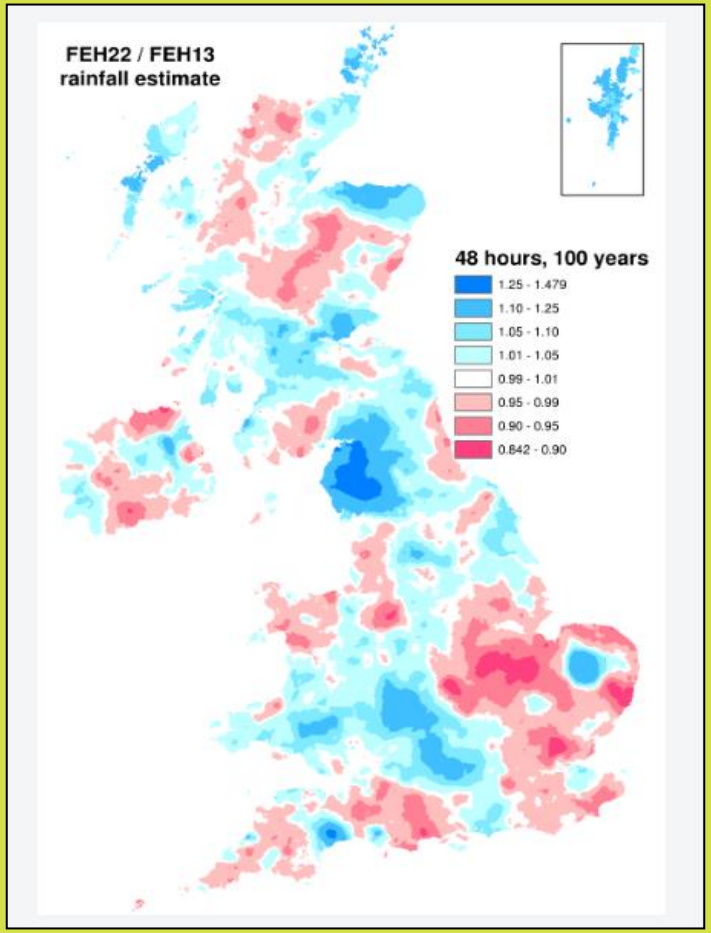
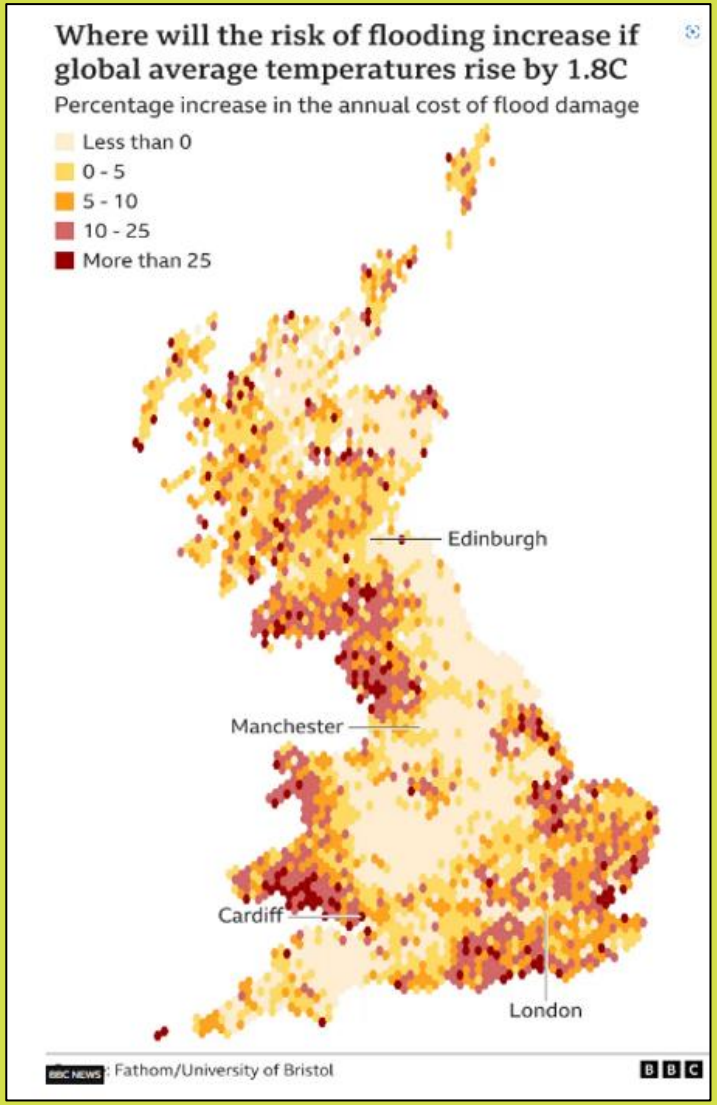
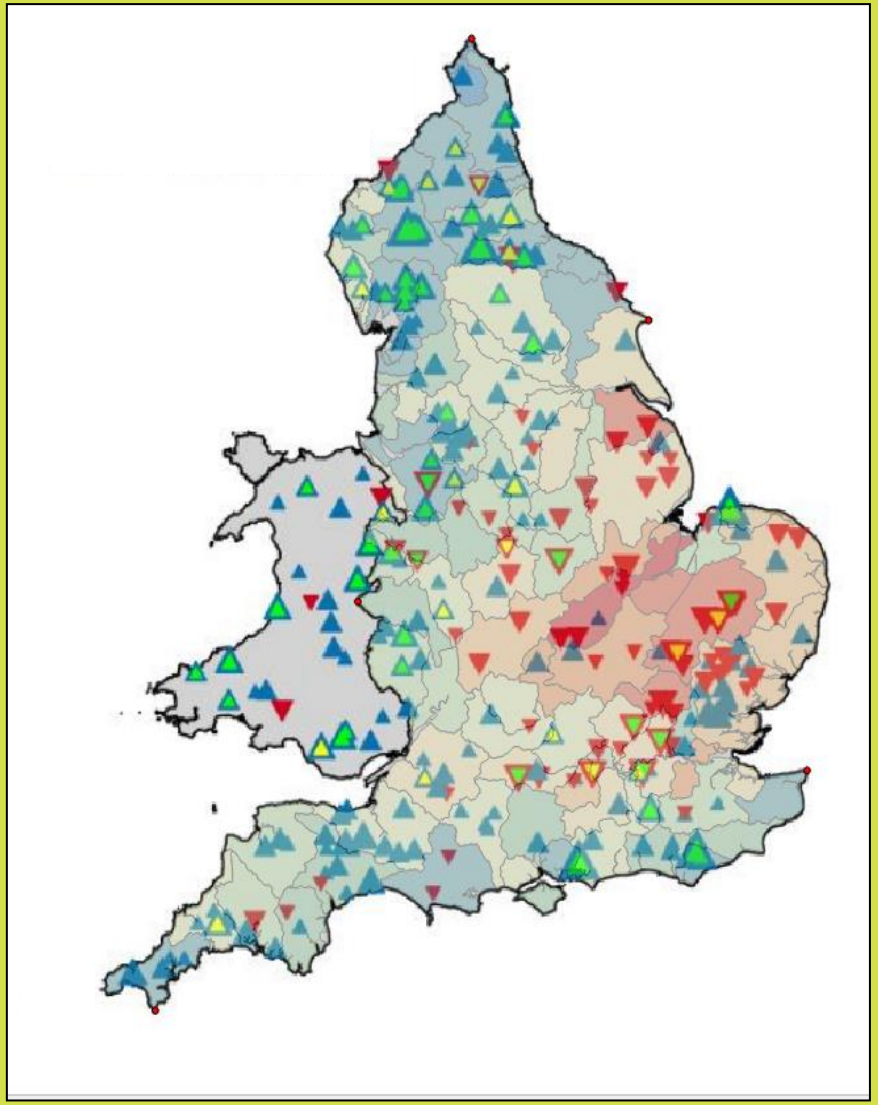
Other studies







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This project is 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.

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