


FLOOD FORECASTING CENTRE

A working partnership between

Keeping Our Rivers Flowing Summit
29 March 2023

Adapting to our changing climate; operational experience and partnership working in action.

Russell Turner CWEM FCIWEM
Head of Flood Forecasting Centre



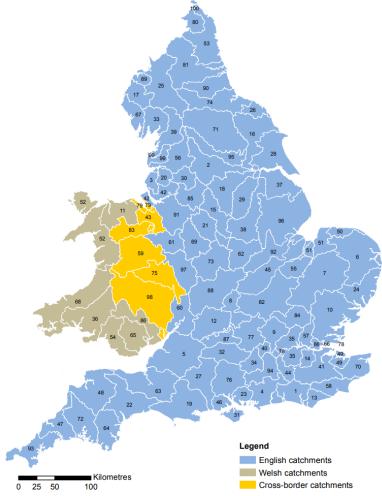
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Flood Risk across England and Wales

- Multitude of small catchments across England and Wales
- Three main coastlines which experience large tidal ranges, large waves and storm surges
- Large managed floodplains with drainage, storage and pumping systems
- Many large cities and towns on both rivers and the coast
- Majority of properties at risk of surface water / flash flood risk
- Large areas also at risk of prolonged groundwater flooding
- National infrastructure, transport network, schools and health systems at risk of flooding
- ...against a background of a warming climate**

Water Management Catchments



Map produced March 2013
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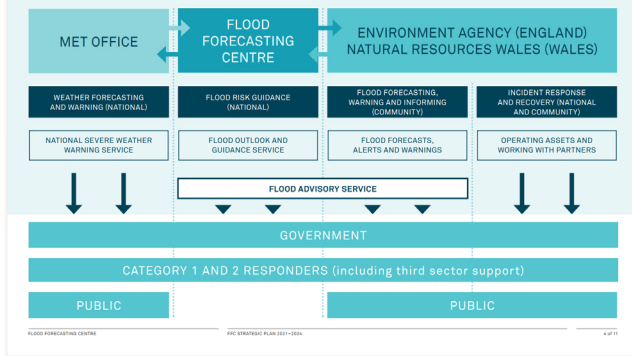
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Flood Forecasting Centre

WHAT WE DO

WE PROVIDE A NATIONAL FLOOD FORECASTING AND GUIDANCE SERVICE TO SUPPORT GOVERNMENT AND CATEGORY 1 AND 2 RESPONDERS. TOGETHER WITH THE MET OFFICE AND ENVIRONMENT AGENCY/NATIONAL RESOURCES WALES WE PROVIDE AN INTEGRATED FORECAST-LED INCIDENT MANAGEMENT SERVICE. THIS PROVIDES A CONSISTENT ASSESSMENT OF FLOOD RISK AT A NATIONAL AND LOCAL SCALE.



- Forecast flood risk for Category 1 and 2 responders in England and Wales
 - Flood Guidance (1-5 days)
 - Flood Outlook (6-30 Days)
- Provide planning scenarios for warnings
- Support training and exercising
- Engage users
- Manage systems and models
- Deliver forecasting improvements

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Evolution of the FFC

- Summer 2007 - severe inland flooding
- Autumn 2009 - FFC partnership became operational
- 2010 - Flood & Water Act (inc Surface Water risk)
- 2014 – FFC embedded within Flood Emergency Framework
- 2013/14 and 2015/16 two wettest winters in 250yr record
- 2016 – Forecast led approach becomes established
- 2020 – Working remotely from February (Covid 19)
- 2020 – February Floods Ciara, Dennis and Jorge
- 2021 – Storm Christoph (Jan) and London Flooding (June)
- 2022 – February Floods Dudley, Eunice and Franklin



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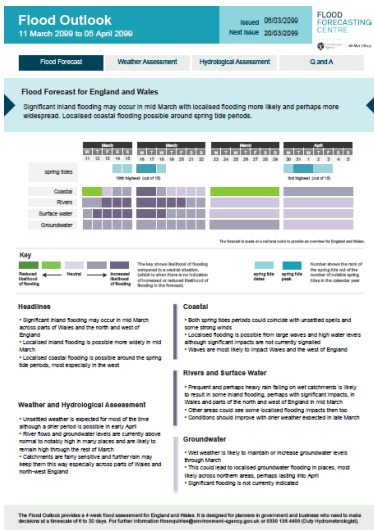
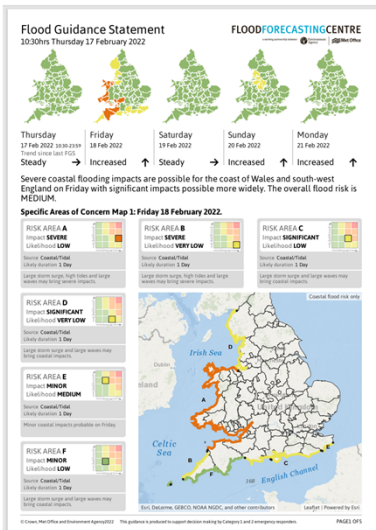
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Current Services – Flood Guidance and Flood Outlook

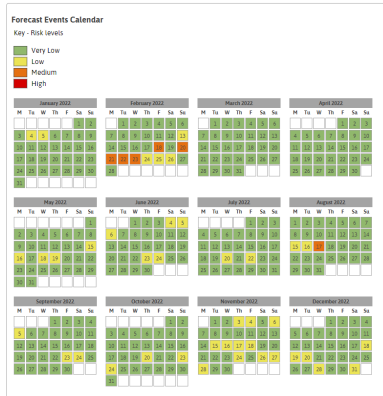


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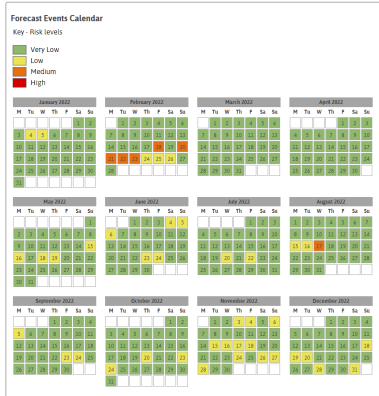
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Forecast Flood Risk 2022

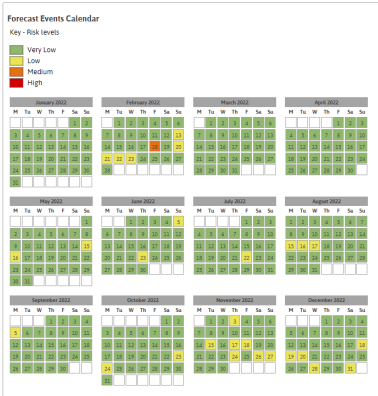
England and Wales



England (only)



Wales (only)



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Results

Forecast Flood Risk - England and
01 January 2015 – 15 March 2023
Colour Stripes Chart - Forecast Events

Key - Risk Levels

- Very Low
- Low
- Medium
- High

Learning from Operational Experience

- Illustrate national and local risk with forecast and verified actual flooding
- Highlights year round nature of flooding
 - Prolonged events
 - Intense events
- Introduced seasonal readiness work ahead of winter and summer / convective seasons

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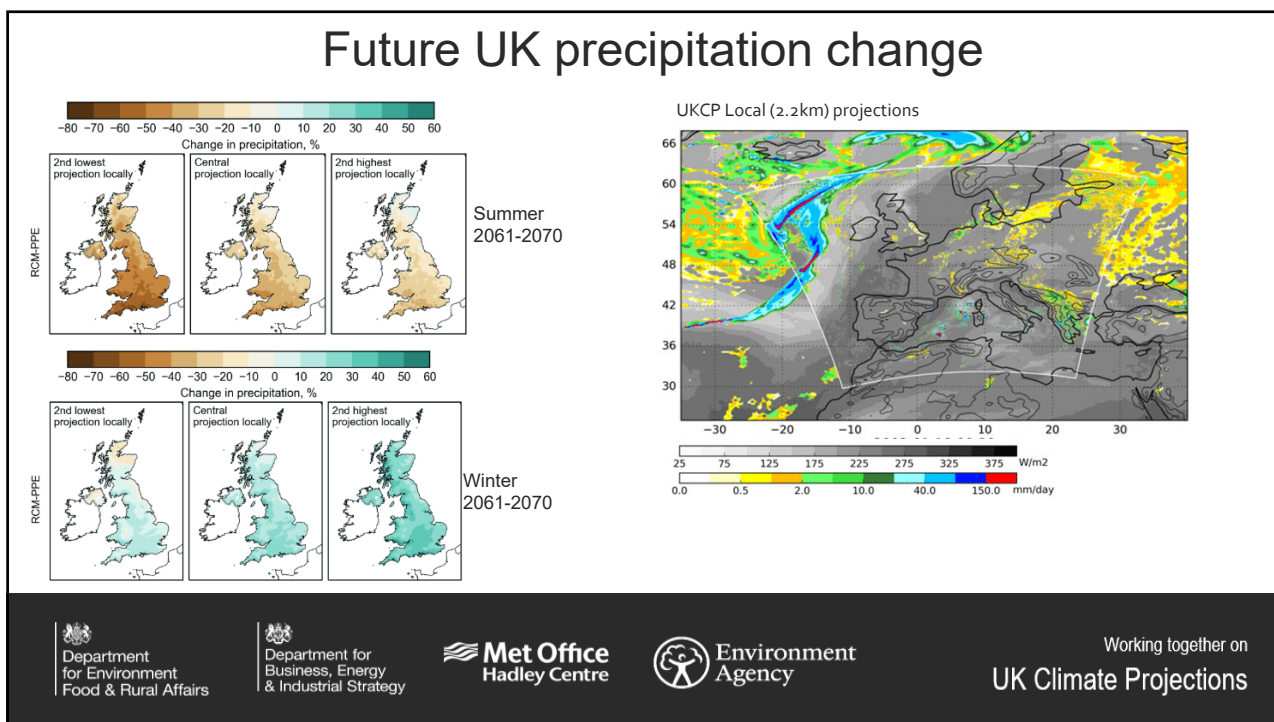
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Future change:

“a greater chance of warmer, wetter winters and hotter, drier summers”

Working together on
UK Climate Projections

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Implications for changing flood hazard over UK

- **More short-duration rainfall extremes** important for localised flash flooding (exceeding 30mm/h 2x more frequent across UK by 2070s compared to 1990s under RCP8.5)
- Potential for significant **increase in occurrence of slow-moving storms**, with potential for large precipitation accumulations locally
- Increase in contribution of **large organised convective storms** to precipitation (3x over British Isles in summer), with implications for more widespread flooding
- **Winter storms will become more like present-day autumn ones** (with more embedded convection).
- **Local surface water flood hazard is changing** - Pluvial flood hazard can be quite different when full spatio-temporal information on rainfall and how this will change is input into the hydrodynamic model. e.g. flood estimates for Bristol are higher using a UKCP Local event set compared to standard IDF uplift approach.
- **Flood hazard in river catchments is also changing** - Fluvial flood hazard obtained when driving a hydrological model with the full UKCP Local timeseries data is different from results with coarser resolution climate model output. Future changes in peak discharge vary between catchments.
 - For Thet, UKCP Local central estimate is greater than EA central uplift (likely due to increased intensity of rainfall in Local 2.2km model).
 - For Dyfi, UKCP Local upper estimate is considerably below NRW upper estimate (likely due to use of full spatio-temporal information on rainfall).

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Summary

- Highest natural hazard risk for the UK - significant events over the last 30 years
- Our partnership approach has helped better prepare for routine and extreme events
- Our improvement work helps to do more e.g. winter pilot with rural sector
- Latest modelling is really bringing out the level of detail for more local/regional approaches across UK



COVERACK 2017 – 200MM IN 3 HOURS

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russell.turner@environment-agency.gov.uk

Email ffcenquiries@environment-agency.gov.uk

Phone 0330 135 4400

Web www.gov.uk/government/organisations/flood-forecasting-centre

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