

## Forecasting extreme Floods – 10 years rich learning from the Flood Forecasting Centre

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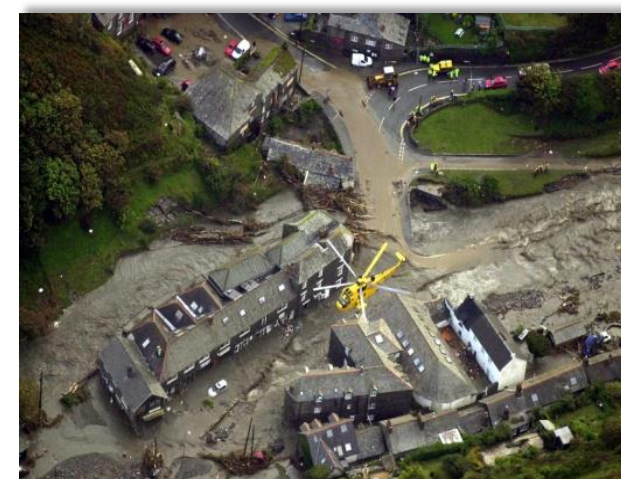




# Significant Flood Events



Year	Flood event	Properties flooded
2013/14	Winter Floods (Dec 13 to May 14)	11,000
2012	2012 Floods (Mar-Dec)	7,900
2010	Cornwall November 2010	250
2009	Cumbria November 2009	1,500
2008	Morpeth September 2008	1,250
2007	Summer 2007	55,000
2006	Thames August 2006	190
2005	Cumbria January 2005	2,500
2004	Boscastle August 2004	60
2003	Thames	700
2001	Thames October 2001	110
2001	Thames February 2001	120
2000	Thames December 2000	240
2000	Autumn 2000	10,000
1998	Easter 1998	4,500



# North of England floods: 5 December 2015 to 6 January 2016

**Record rainfall**



December was the wettest month ever recorded\*

**341.4**  
mm



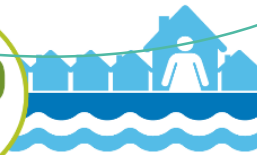
Highest 24 hour rainfall - Honister Pass, Cumbria

**14**



Catchments experienced their highest ever river flow

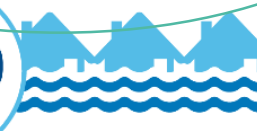
**12,500**  
(Desmond)



**10,900**  
(Eva)

Properties protected during storms Desmond and Eva

Around  
**13,000**  
households



Around  
**4,000**  
businesses

Properties flooded\*\*

Over  
**350**



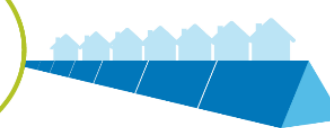
Communities visited by flood support officers

**92**



Severe Flood Warnings issued

**2,300**



Metres of temporary barriers used to protect communities

Around  
**650**

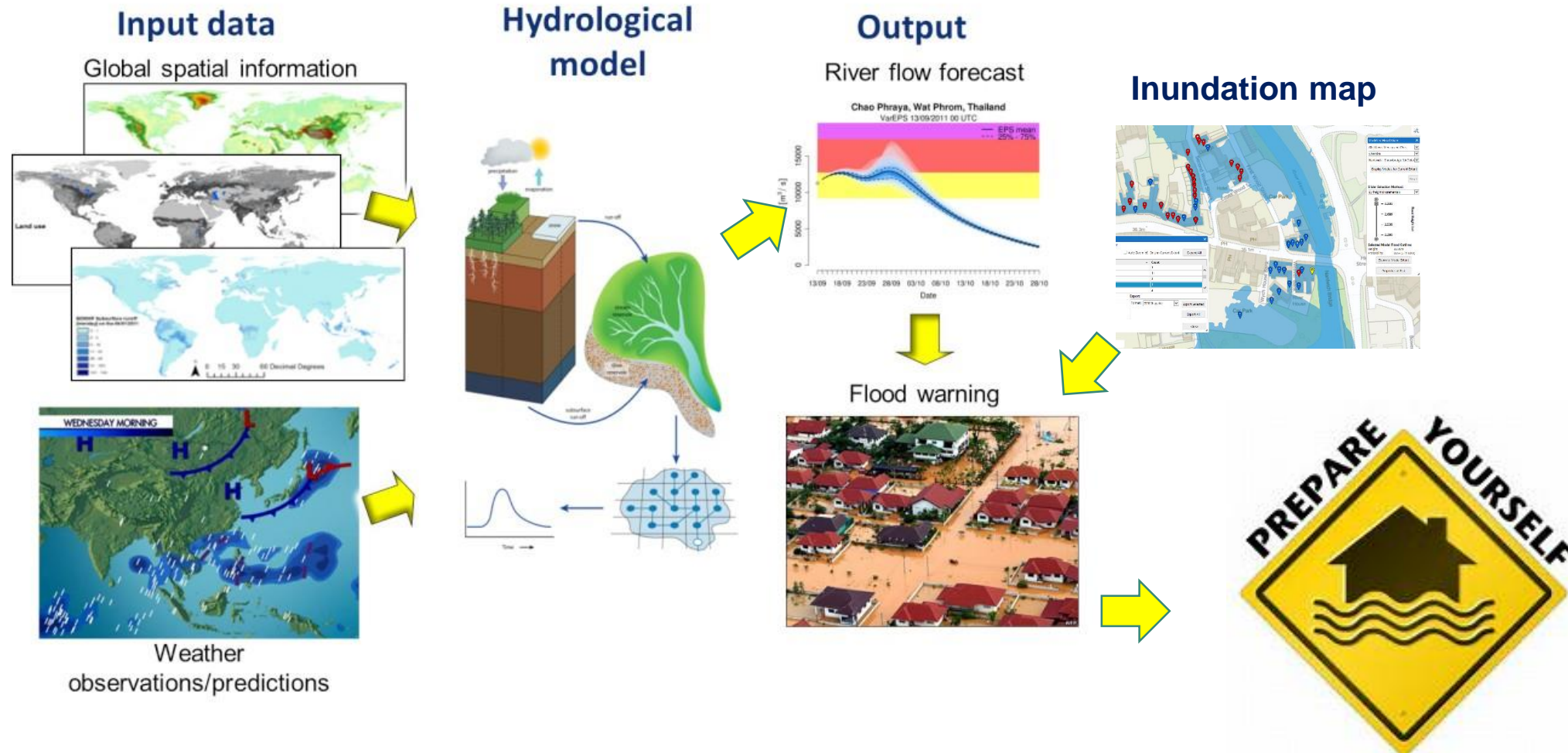


Flood risk assets needing repair

\*Met Office data \*\*Department for Communities and Local Government data



## Flood Forecasting - absurdly complex!



## Expect extremes

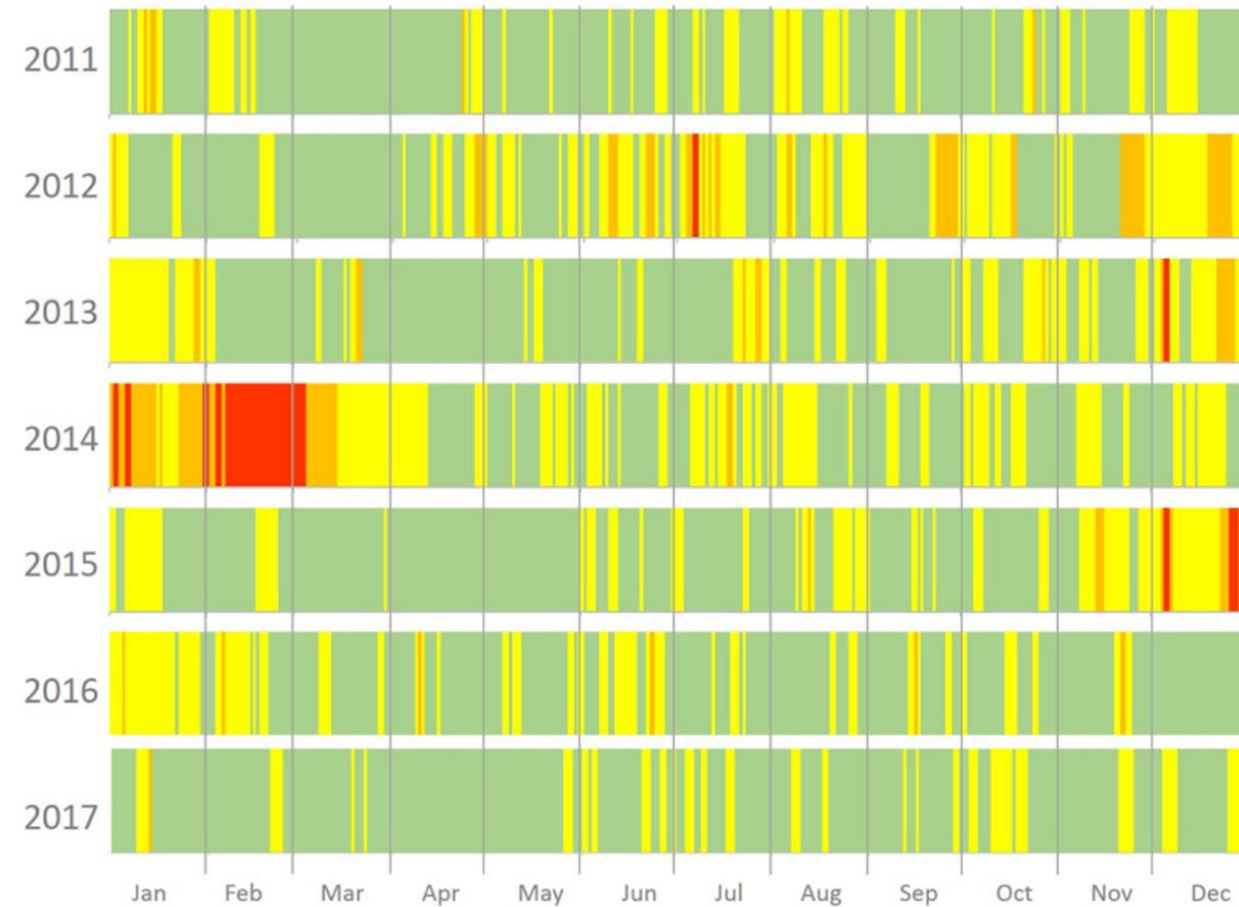




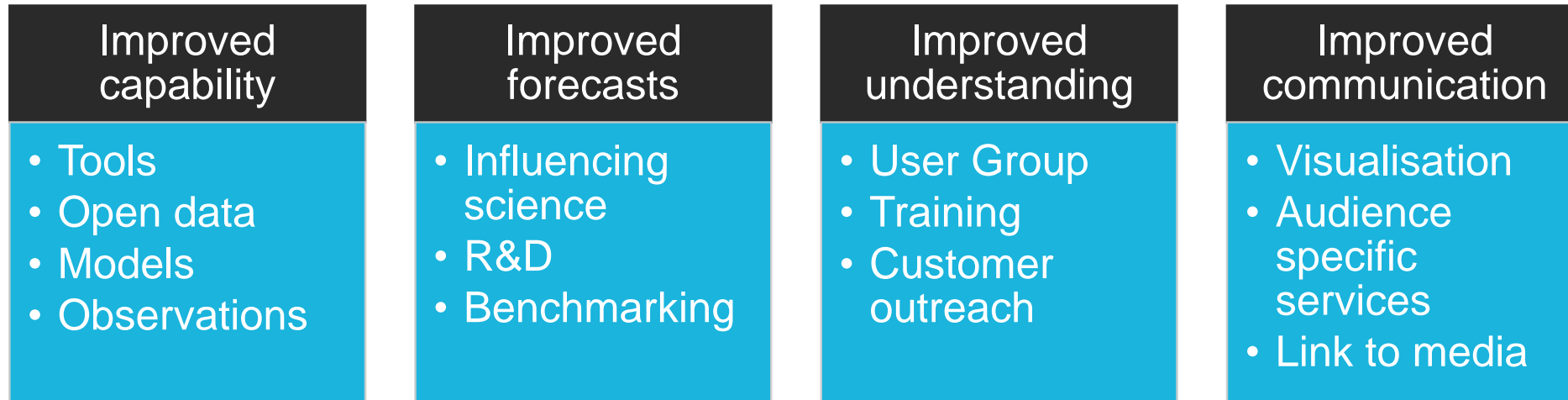




## ‘Barcode Calendar’ of forecast flood risk



## More than an operational centre



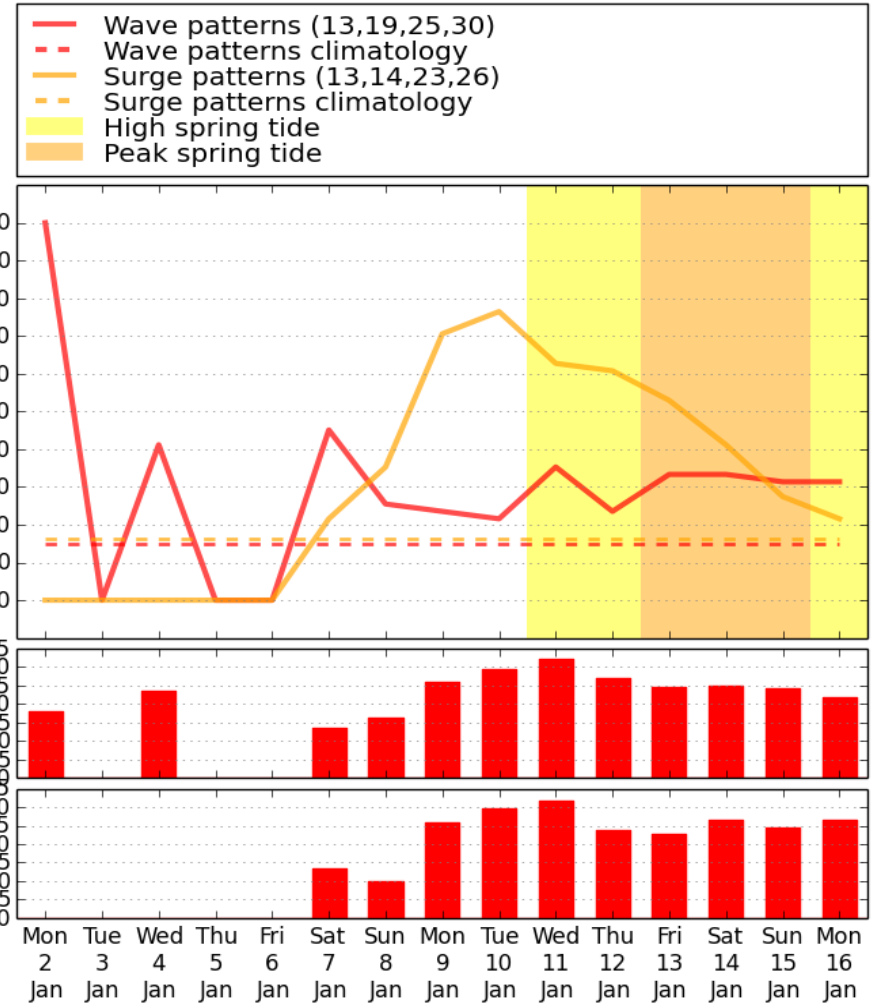
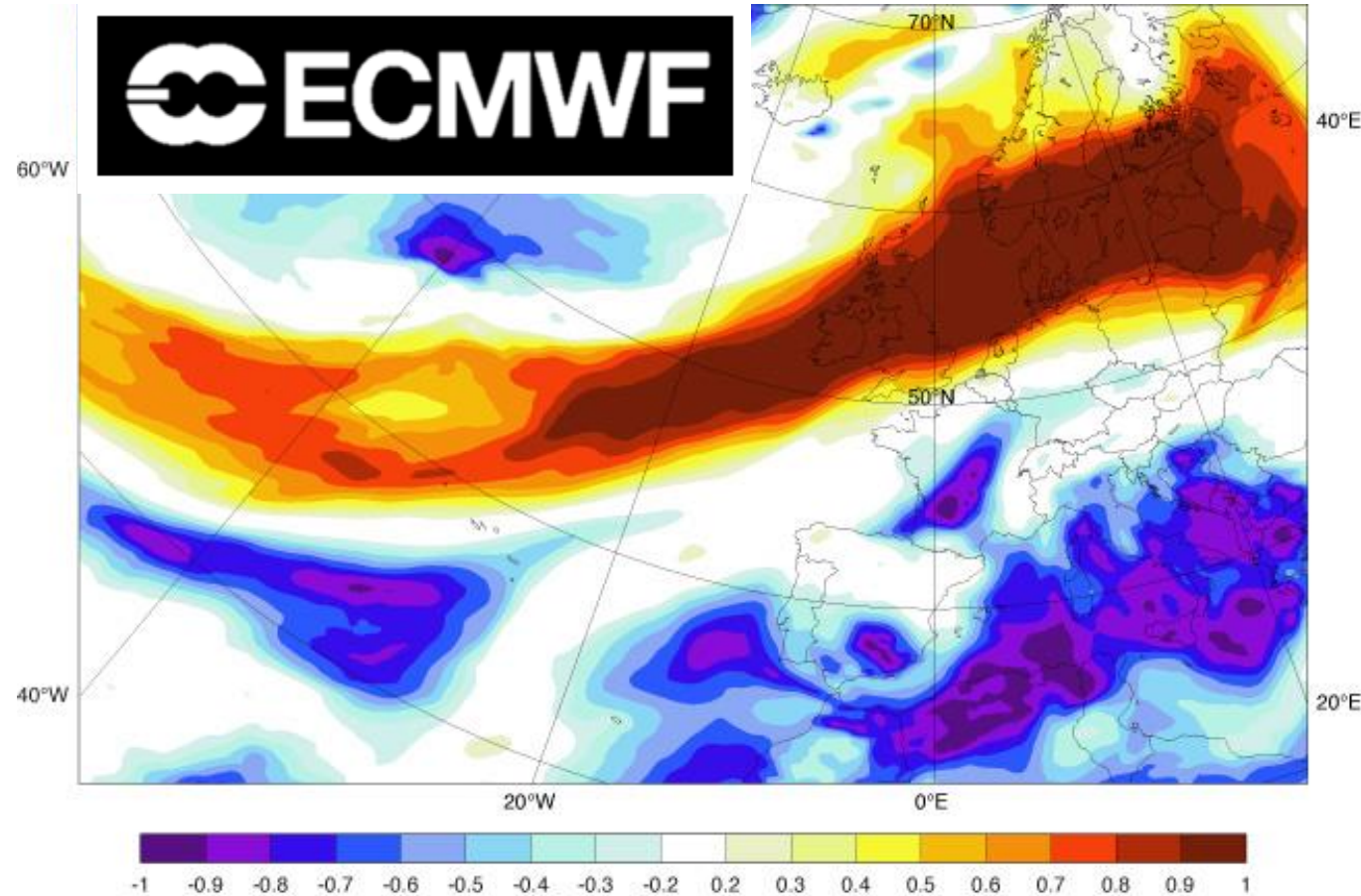
Accurate, timely forecasts communicated well

**Enabling ever more effective planning and response**



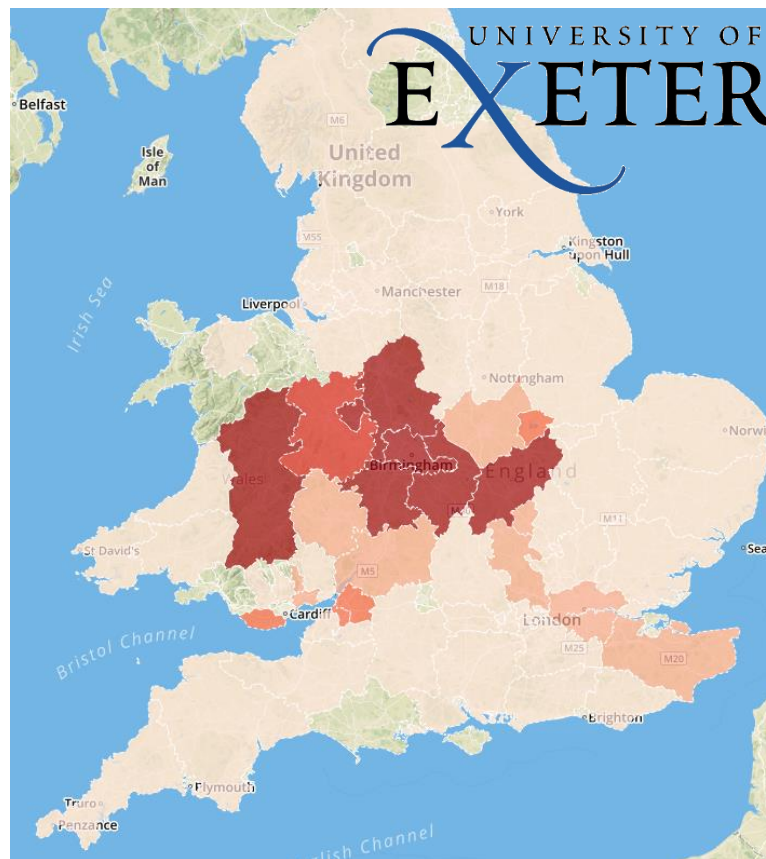
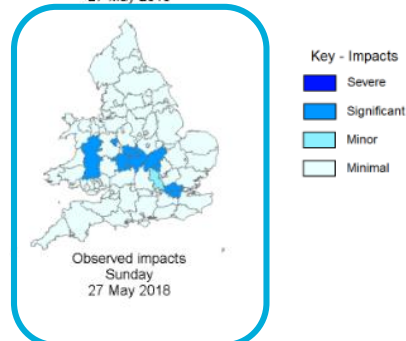
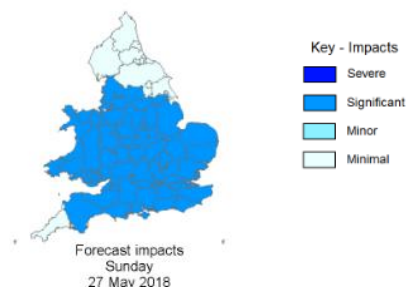
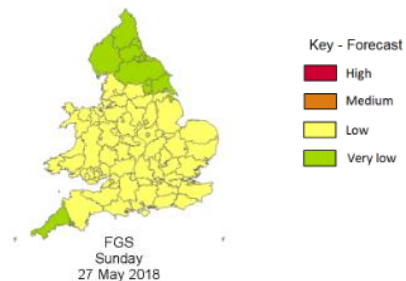
## Accurate – at longer lead times

02 Jan -  
**Lowestoft**  
(11 day lead  
time)



# Timely information

## 27 May 2018 – Birmingham thunderstorms



Showing 100 Tweets from west midlands: Exceedence probability 0.11%

@daytonacnarger

BBC News - Storms flood Birmingham streets

[bbc.co.uk/news/video\\_and...](https://bbc.co.uk/news/video_and...)

11:49 PM - May 27, 2018

See TJ Smith's other Tweets

HeatingProfessionals  
@HeatingProf

Flash floods close roads in Birmingham

[telegraph.co.uk/news/2018/05/2...](https://telegraph.co.uk/news/2018/05/2...)

11:47 PM - May 27, 2018

See HeatingProfessionals's other Tweets

Andrew Duncan  
@andrewsduncan1

Flash floods in UK close roads in parts of

motorists being told to avoid Birmingham

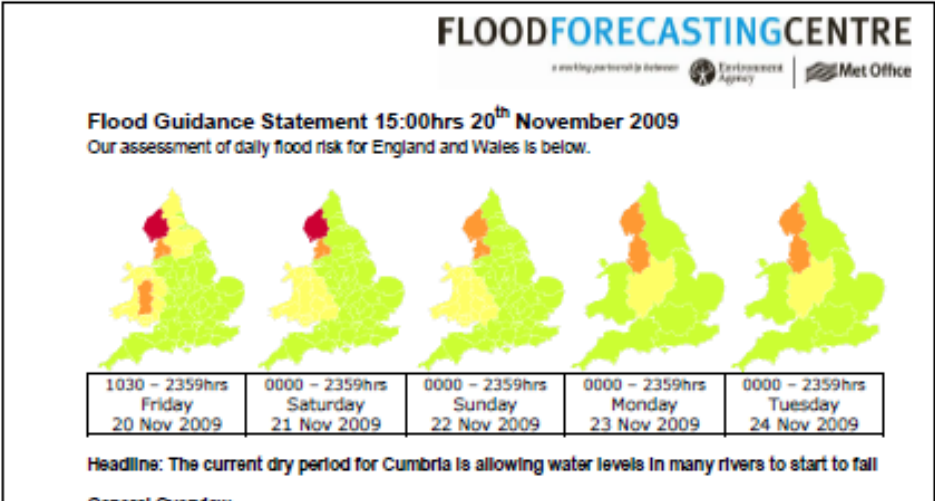
[#FlashFloods #Birmingham theguardian.com](https://theguardian.com...)

11:44 PM - May 27, 2018

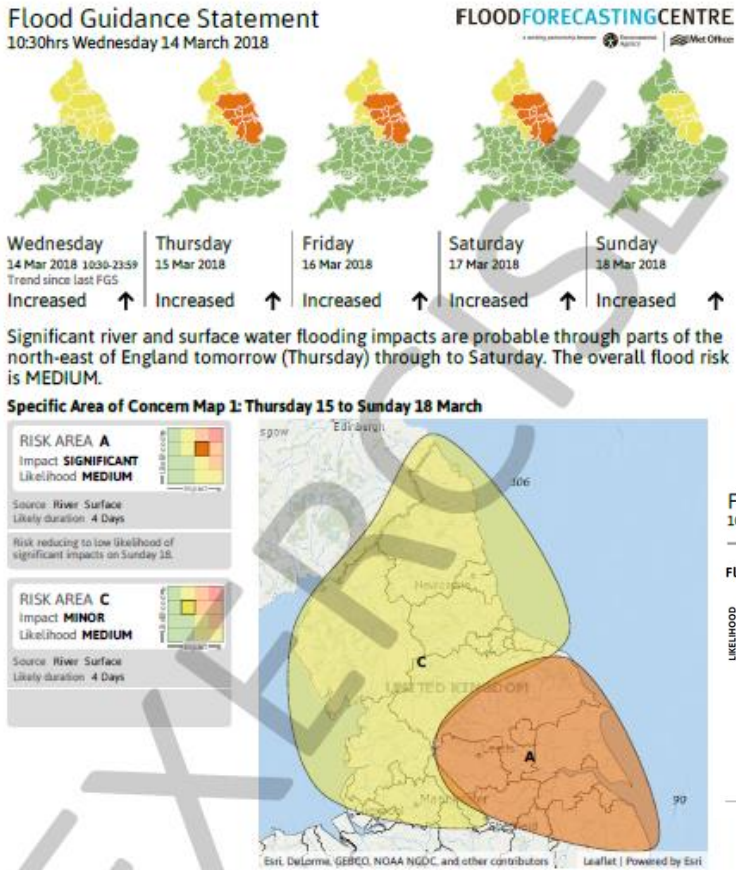
See Andrew Duncan's other Tweets



Communicated well; 2009 vs 2017 Flood Guidance Statement



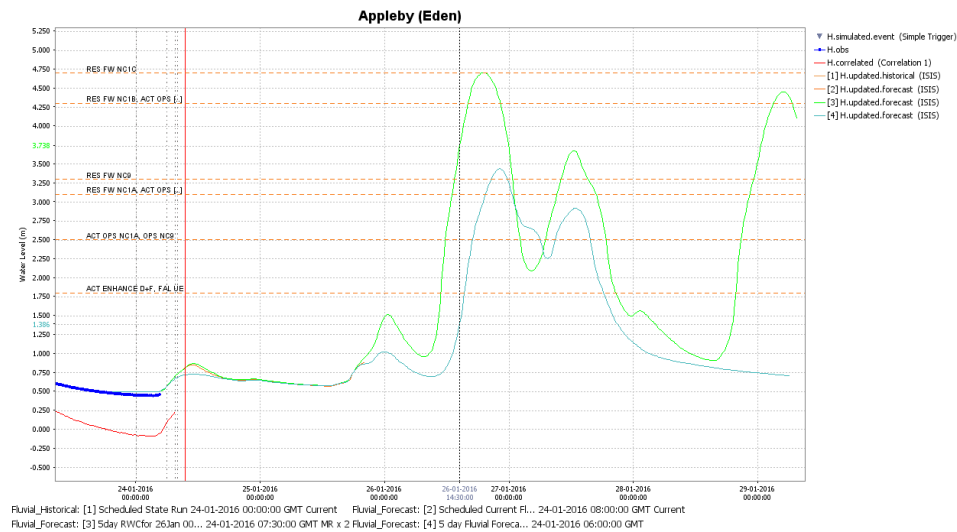
Key	Very low risk	Low risk	Medium risk	High risk
<b>RIVER &amp; COASTAL FLOODING</b> Probability >100 properties will flood, or extreme danger to life, from rivers or the sea.	<20%	≥20% to <40%	≥40% to <60%	≥60%
<b>EXTREME RAINFALL</b> Probability that ERA thresholds will be met, leading to possible surface water flooding.	<10%	≥10% to <20%	≥20% to <60%	≥60%
<b>Suggested actions</b>	<ul style="list-style-type: none"><li>Business as usual</li></ul>	<ul style="list-style-type: none"><li>Consider liaising with partner organisations</li><li>Be aware of the latest weather/flood warnings and alerts</li></ul>	<ul style="list-style-type: none"><li>Consider liaising with partner organisations</li><li>Consult surface water flood maps and local flood warning plan maps as appropriate</li><li>Consider activating emergency procedures</li></ul>	



## Future Environment Agency online enhancements

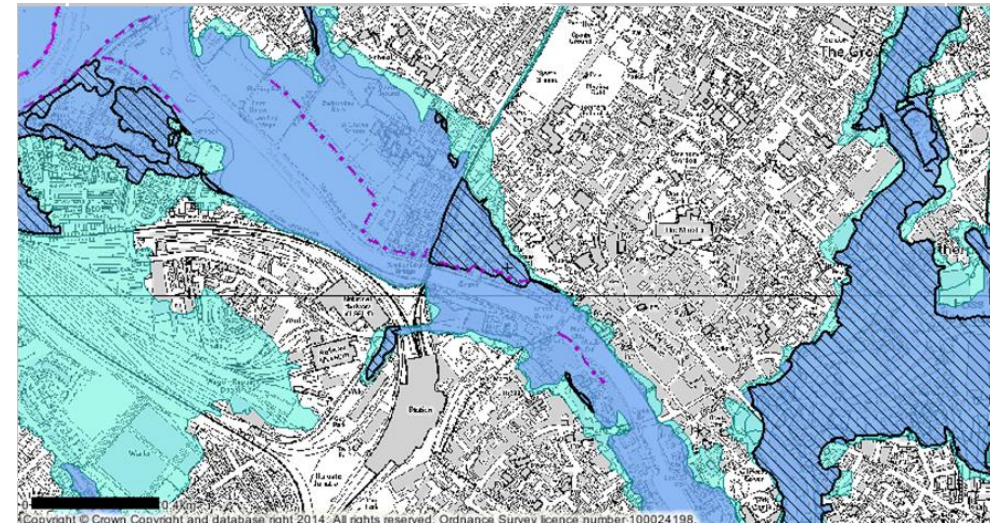
Less of this

*River level has crossed the x threshold so a warning Y has been issued to properties in the warning area*



More of this

*We forecast that the area shown in the map will flood, this will affect X properties, Y infrastructure, Z transport*





## Future opportunities

- Collaborate more, think different – build relationships & MoU's
- Greater accuracy at longer lead times – Core cities?
- Ever clearer and more granular communication
- Big, BIG and even **BIGGER** data!
- Better systems for modelling and verifying impacts e.g. HYDRO Jules

*Providing trusted guidance to help protect lives and livelihoods from flooding*

Bridgwater  
Somerset

