

Flood hydrologists - thoughts for the future

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Overview

⌚ Winter 2013/14

- ⌚ Scale and context
- ⌚ Strengths and weaknesses

⌚ Thoughts for the future

- ⌚ Public and political expectations
- ⌚ Environment Agency roles
- ⌚ Hydrologists as leaders and communicators



'We've had a month's worth of abuse in less than 24 hours'

Winter 2013/14

England

- ⌚ wettest winter in nearly 250 years
- ⌚ highest sea levels on record at Class “A” gauges at Liverpool and all locations from Newhaven to Whitby

Southern England

- ⌚ wettest January since 1910
- ⌚ wettest December for 50 years
- ⌚ fourth wettest February since 1910
- ⌚ Dover sea level of 4.76 m AOD was 40 cm higher than next highest level (90 year record)

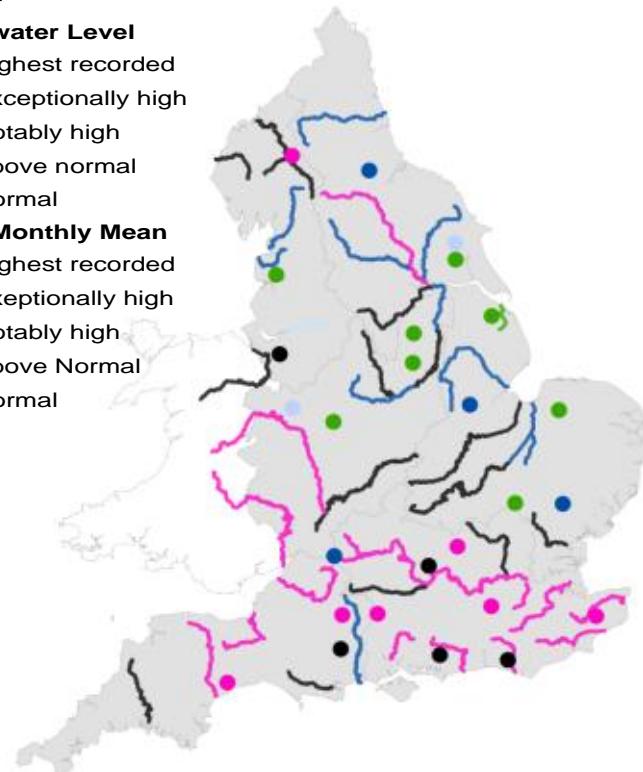
Legend

Groundwater Level

- Highest recorded
- Exceptionally high
- Notably high
- Above normal
- Normal

Rivers. Monthly Mean

- Highest recorded
- Exceptionally high
- Notably high
- Above Normal
- Normal





Hemsby
Norfolk
6 December 2013



Boston
Lincolnshire
7 December 2013



Keadby on Trent
Lincolnshire
5 December 2013

East Coast

- ⌚ 1953 learning proved its worth
- ⌚ Early forecasting effective
- ⌚ 2013 East Coast Emergency Framework built relationships and understanding
- ⌚ Thames Barrier closed 50 times – highest level since completion



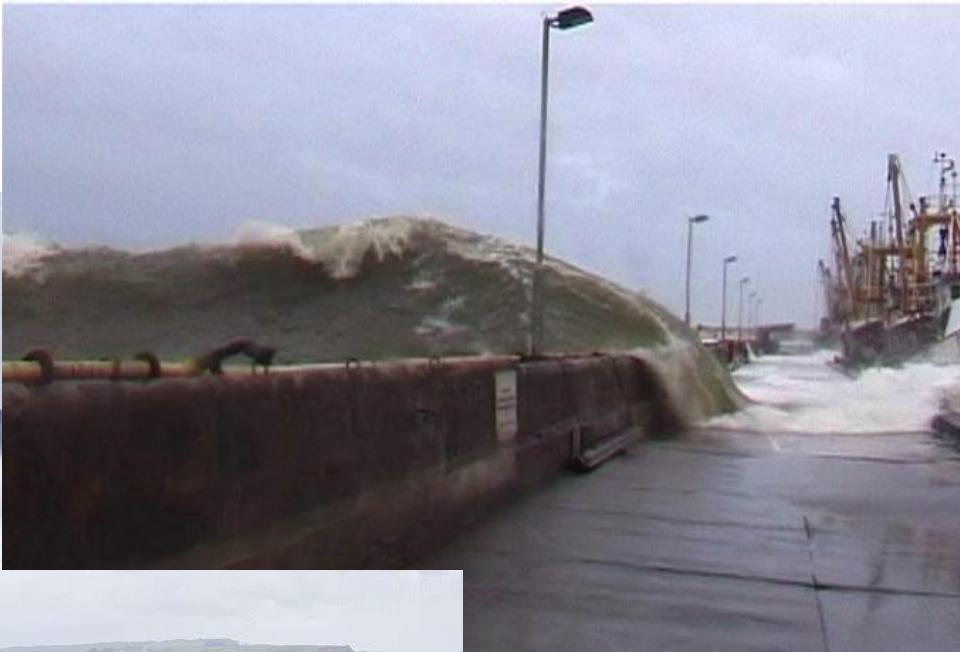
	January 1953	December 2013
Breaches	1200 different locations	3
Properties flooded	24,000	2,600
Deaths	307	0
Agricultural Land	65,000 hectares	6,800 hectares
People evacuated	32,000	18,000
	0 warnings	71 severe flood warnings

Porthleven Cornwall

5 February 2014

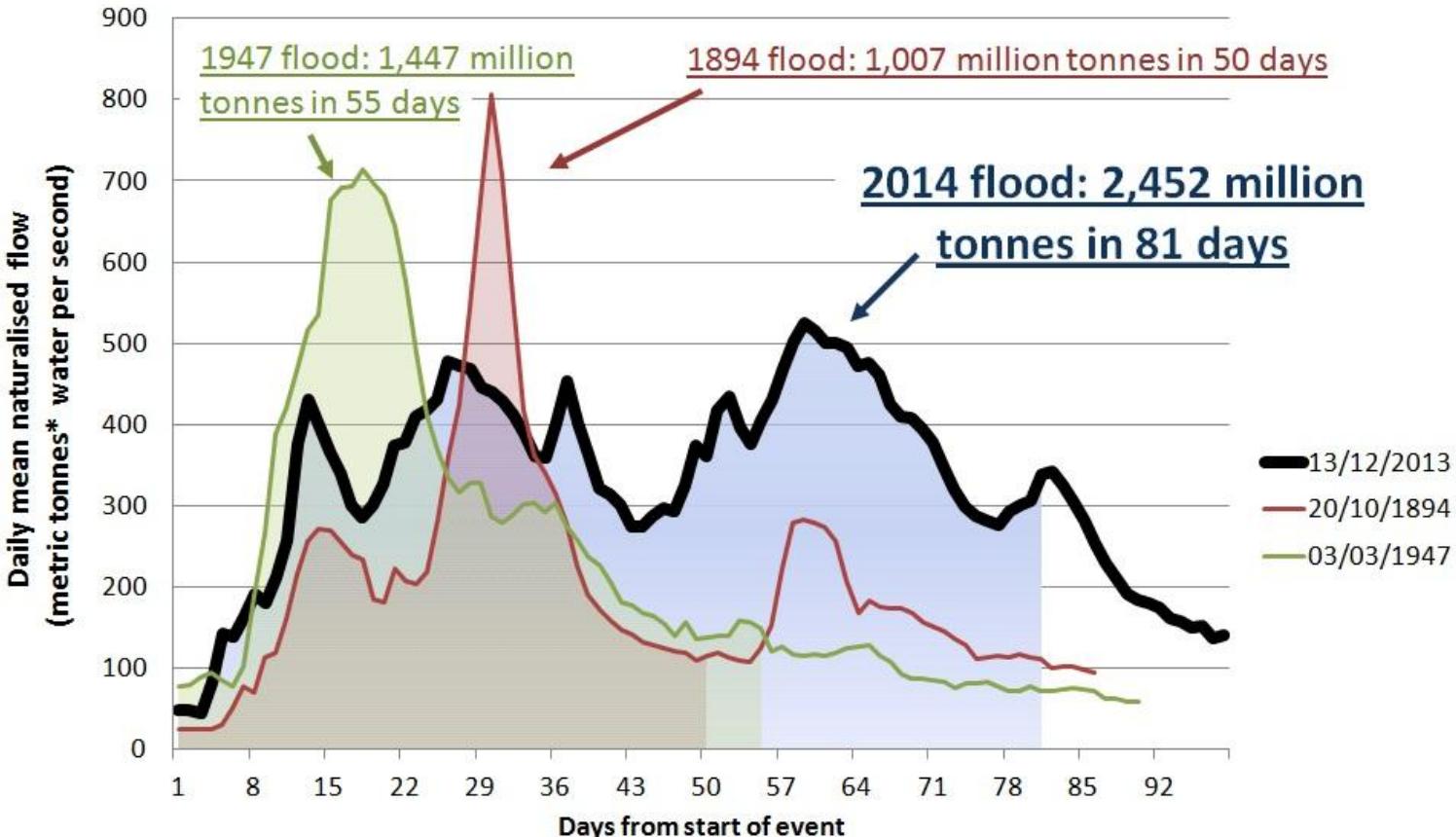


Dawlish
February 2014



Newlyn Harbour
Cornwall
23 December 2013

Comparison of the largest flood events on the River Thames at Kingston





Somerset Levels
January to March 2014

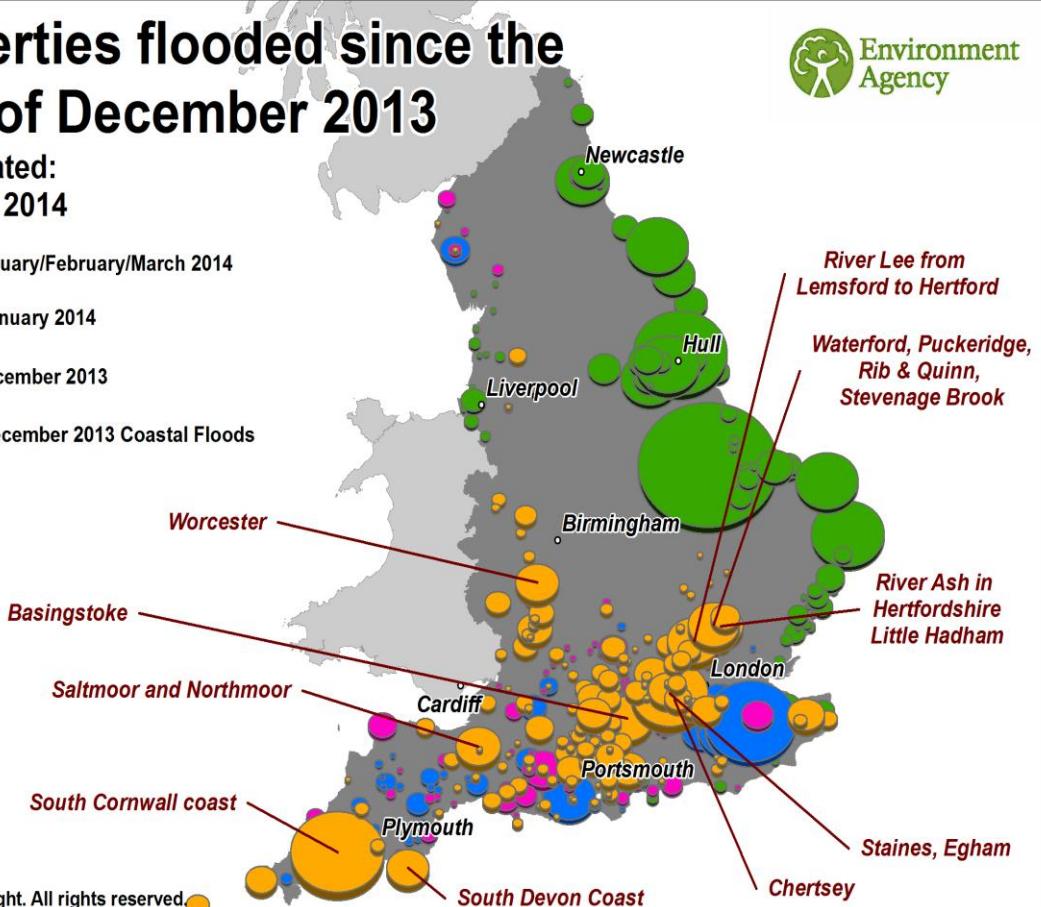


Hambleton
Hampshire
February 2014

Properties flooded since the start of December 2013

Map updated:
24 March 2014

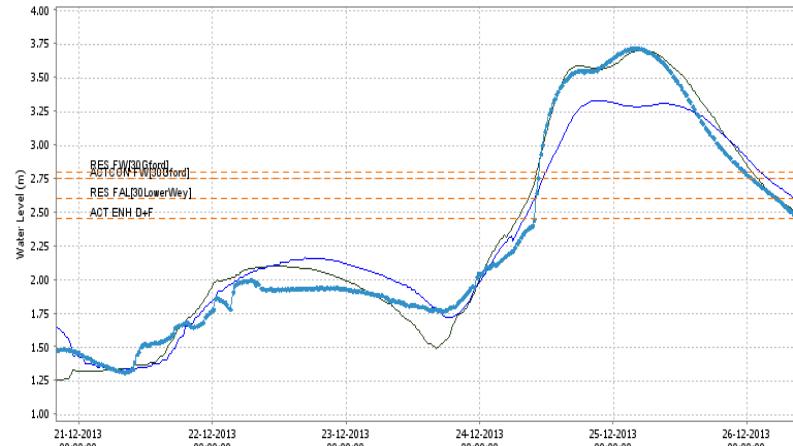
- Late January/February/March 2014
- Early January 2014
- Late December 2013
- Early December 2013 Coastal Floods



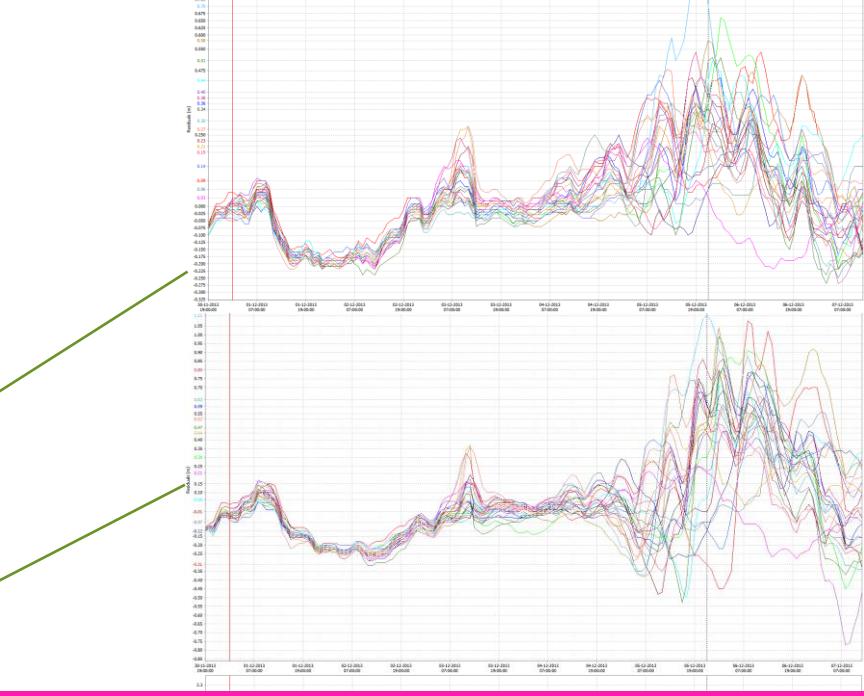
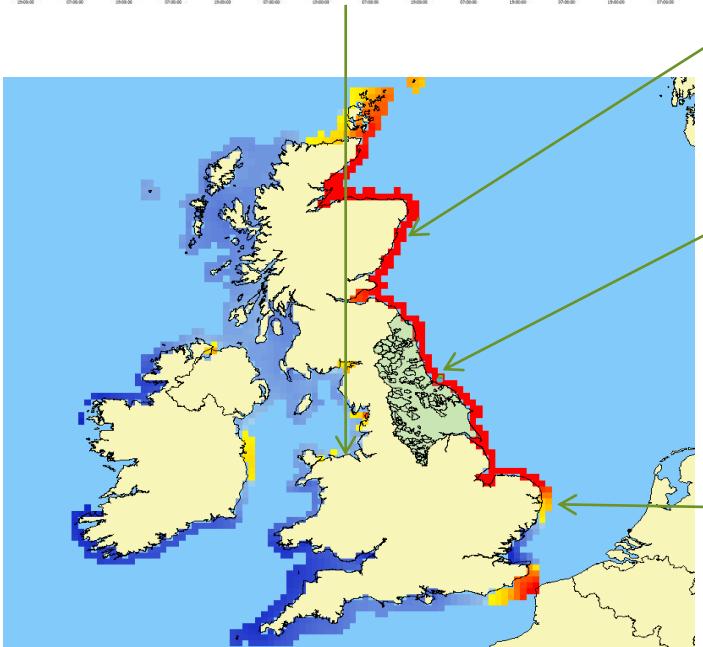
	Number of properties flooded	Number of properties protected
Late Jan/ Feb 2014	2,370	207,000
New Year 2014	720	240,000
Christmas 2013	1,400	80,000
Early Dec 2013 coastal surge	2,600	800,000

Learning points – the service

- ➔ Extreme events provide great data
 - ➔ Efficient flow data collection – resilient sites ?
 - ➔ Lead times excellent
 - ➔ Some atmospheric responses still a challenge
 - ➔ Humber review
 - ➔ Local forecasting model recalibration



Learning points - the service



East Coast Forecasting – December 2013

- 1st : Ensemble models forecast potential
- 2nd :Initial forecast to Government
- 4th: First Severe Flood Warning issued
- 5th: Flooding starts in North-East

Learning points – the customer

→ Narrative of event is essential

- For the media, public and politicians
- Numbers are important but context is critical
- Visuals and infographics beat raw statistics
- Hydrologists *must*
communicate as well
as analyse

CRIP

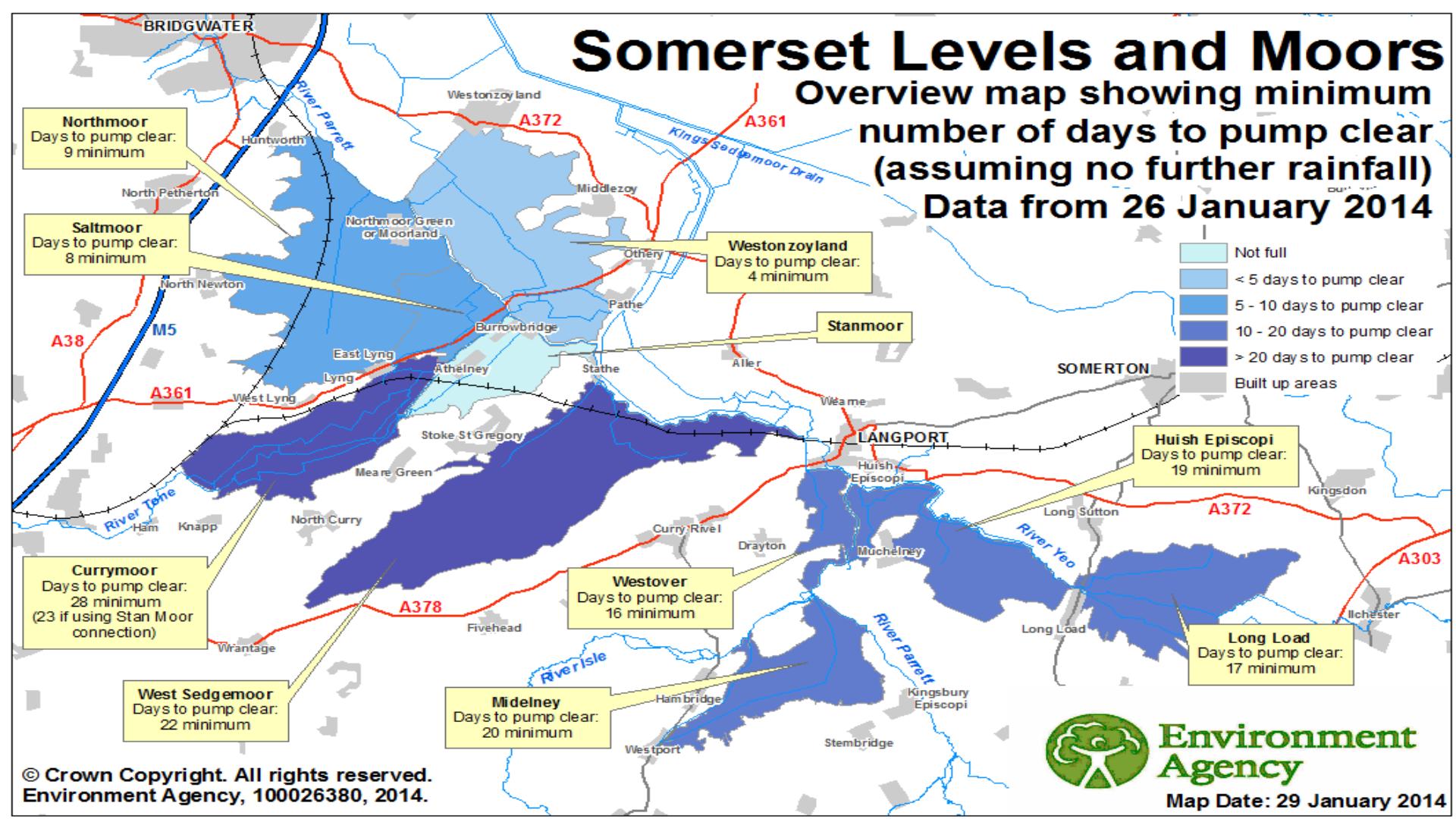
Severe Weather February 2014

COMMONLY RECOGNISED INFORMATION PICTURE

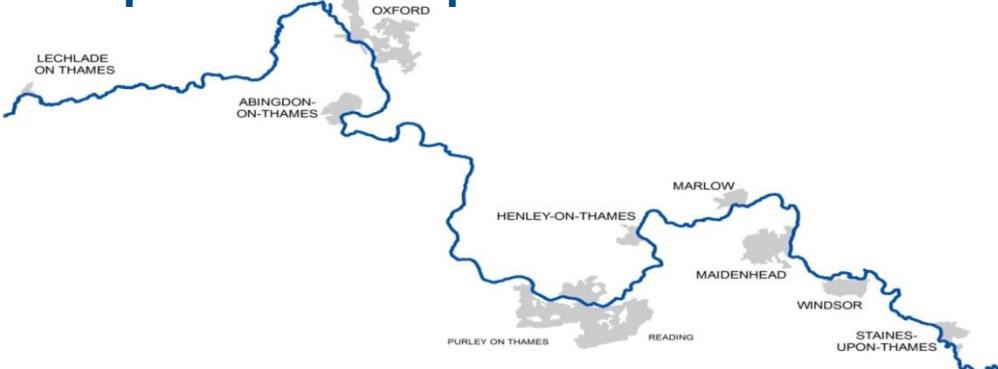
Somerset Levels and Moors

Overview map showing minimum number of days to pump clear (assuming no further rainfall)

Data from 26 January 2014

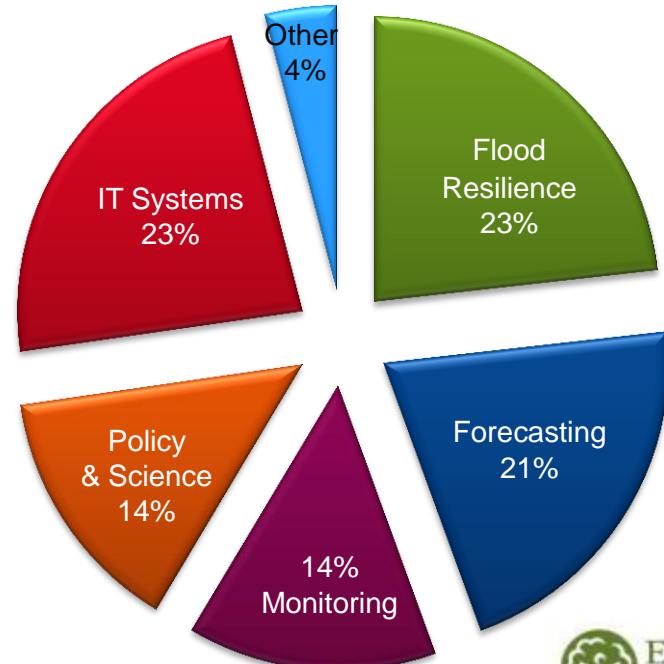


River level forecasts and comparisons with past events



	Status	Period of highest levels	2014 greater than 2003 ?	2014 greater than 2007 ?	2014 greater than 2012 ?
Lechlade	Falling slowly	6th -8th (mon-wed)	Similar	No	Similar
Oxford	Falling slowly	8th-12th (wed-fri)	Similar	No	Yes
Abingdon	Falling slowly	8th-10th (wed-fri)	Similar	Similar	Yes
Purley	Falling slowly	9th (thur)	No	Yes	Yes
Reading	Falling slowly	9th -10th (thurs-fri)	No	Yes	Yes
Henley	Steady	9th (thurs)	No	Yes	Yes
Marlow	Steady	9th-11th (thurs-sat)	No	Yes	Yes
Maidenhead	Steady	9th - 11th (thurs-sat)	Similar	Yes	Yes
Windsor	Rising Slowly	10th - 12th (fri-sun)	No	Yes	Yes
Staines	Rising Slowly	10th-12th (fri-sun)	No	Yes	Yes
Thames Ditton	Dropping Slowly	10th-12th (tides)	Unknown	Yes	Yes

Investing in Flood Incident Management



FIM Plan 2015-20 outcomes

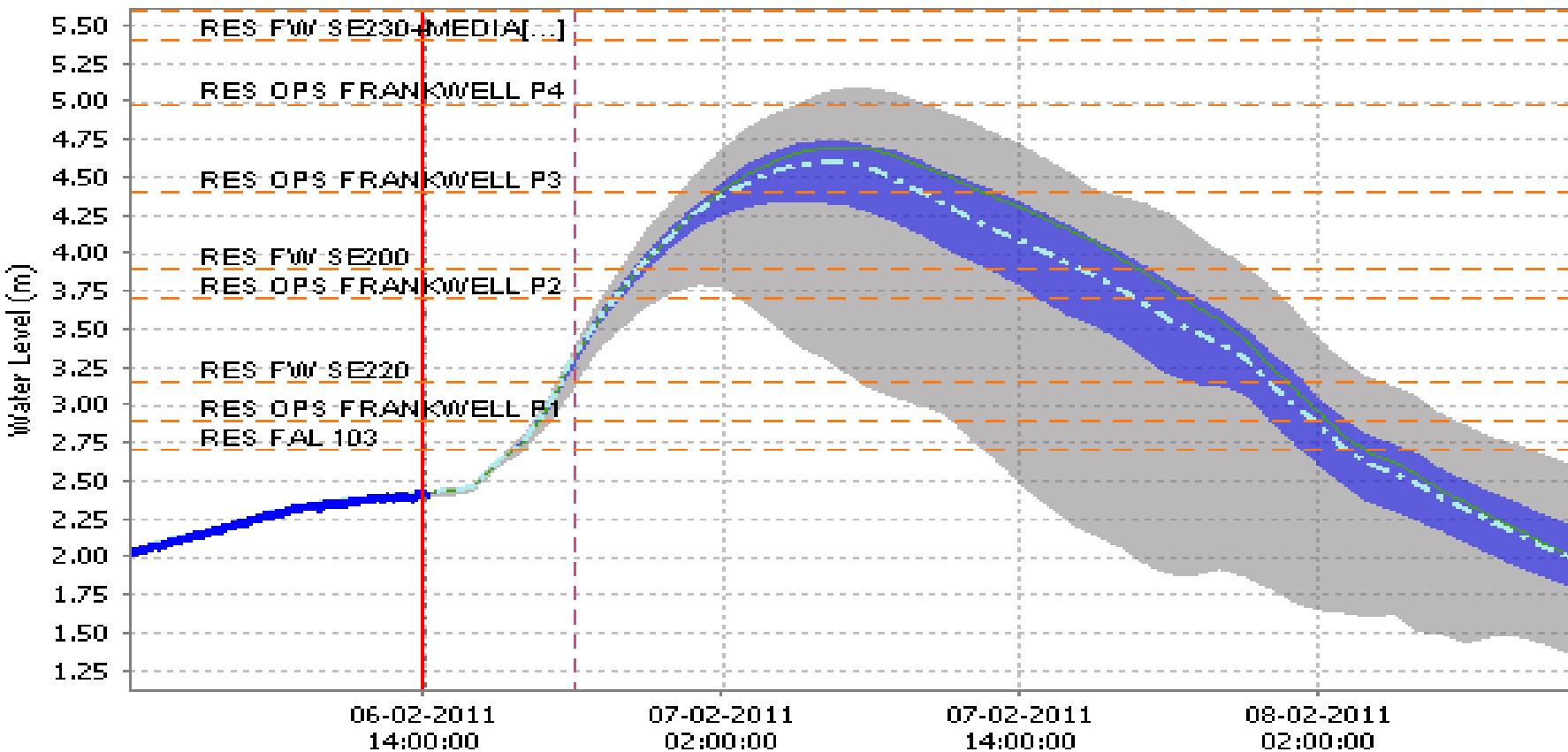
- **Volunteers**
- **“Flood ready”**
- **Training**
- **People and property**

- **Open data**
- **Flood narrative**
- **“Supporting communities”**



- **ITSystems renewal**
- **Consistency**
- **Quality**
- **Professional accreditation**

Sharing probabilistic forecasts



Our Flood Hydrology Services

- ➔ Resilient single national team of 120 flood modellers, mappers and forecasters created
- ➔ Specialist teams to develop expertise
- ➔ Professional training valued and supported
- ➔ Senior career paths added
- ➔ **BUT** it is about customers and communication skills as well as technical skill

Role of our flood hydrologists

“Save lives and livelihoods”

By *advising, informing* and
Influencing others to do the
right thing using:

- ⇒ Data and information
- ⇒ Skill and insight
- ⇒ Stories, visualisations and
great communication skills





Thank you & questions

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