Environment Agency

East coast tidal surge 5th December 2013

Lincolnshire's Response

Lincolnshire Resilience Forum

March 2014

A year that started with 60th anniversary of 'Great Storm' of 1953 …

… prompt for the current generation

… ended with largest surge since, and greatest test of responders

- 5.2metre surge (>70cm than ’53)
- 18-20 km defences overtopped
- 4 breach locations
- 720 properties flooded
- 1,700 hectares agricultural land inundated
- Natural environment damaged
- Boston Stump & Gibraltar Point damaged
- £8.1m worth of damage to infrastructure

© Getty Images

Overview of the storm …

From mid-December to early February, the UK experienced a spell of extreme weather as a succession of major winter storms brought widespread impacts to the UK.

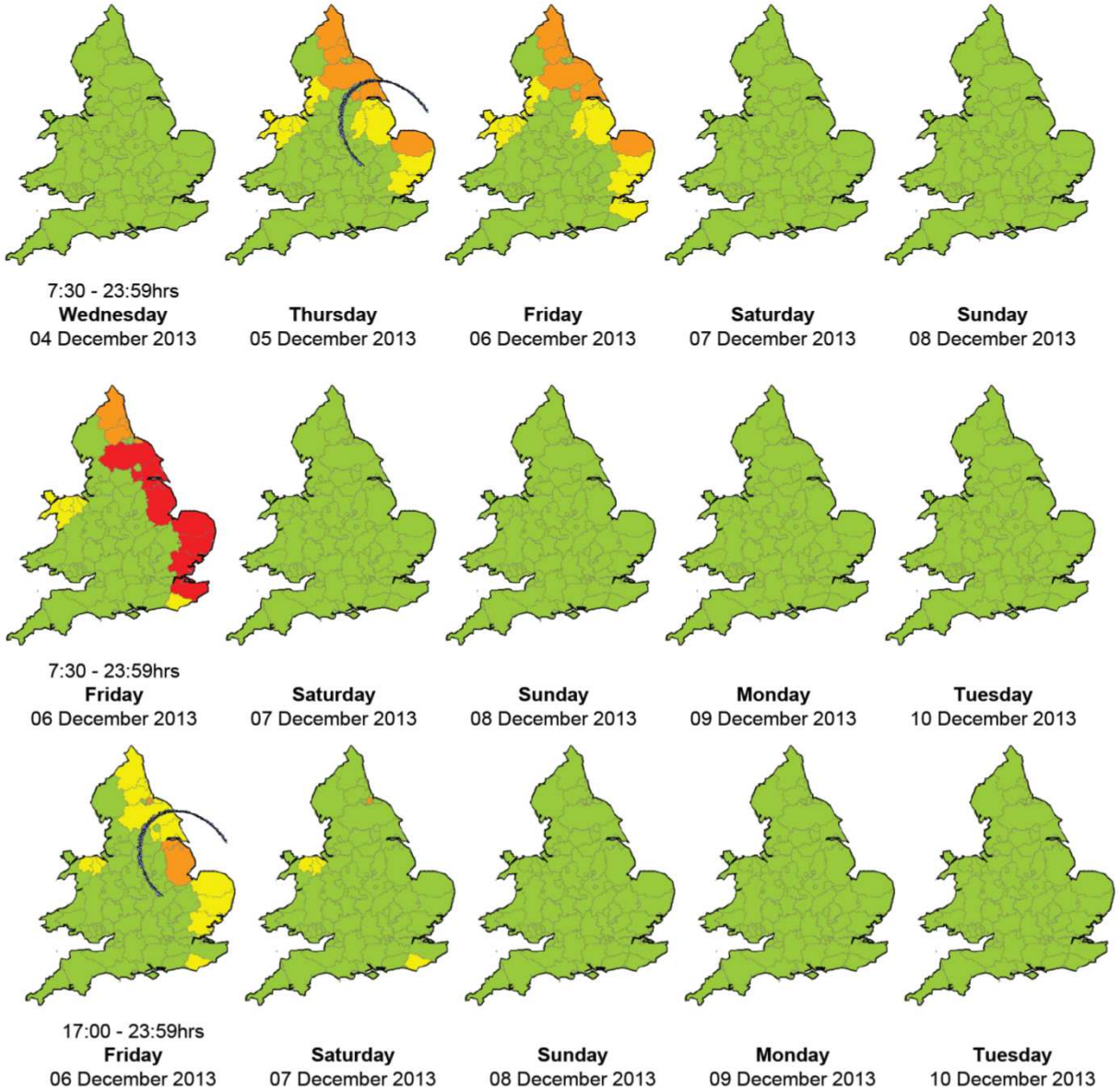
On 5th December - deepening pressure system combining with high astronomical tides and strong to gale force winds generate ‘tidal surges’

Earliest assessments were for ‘wave overtopping and spray’
but risk of breaches *significantly* increased on Thursday as height of surge predicted to reach top of defences

Weather patterns at time of surge were ‘chaotic’ …

FLOODFORECASTINGCENTRE

a working partnership between Environment Agency | Met Office



Wednesday 4th

'Flood Alerts' issued at 6pm

Thursday 5th

'Flood Warnings' issued at 8.50am

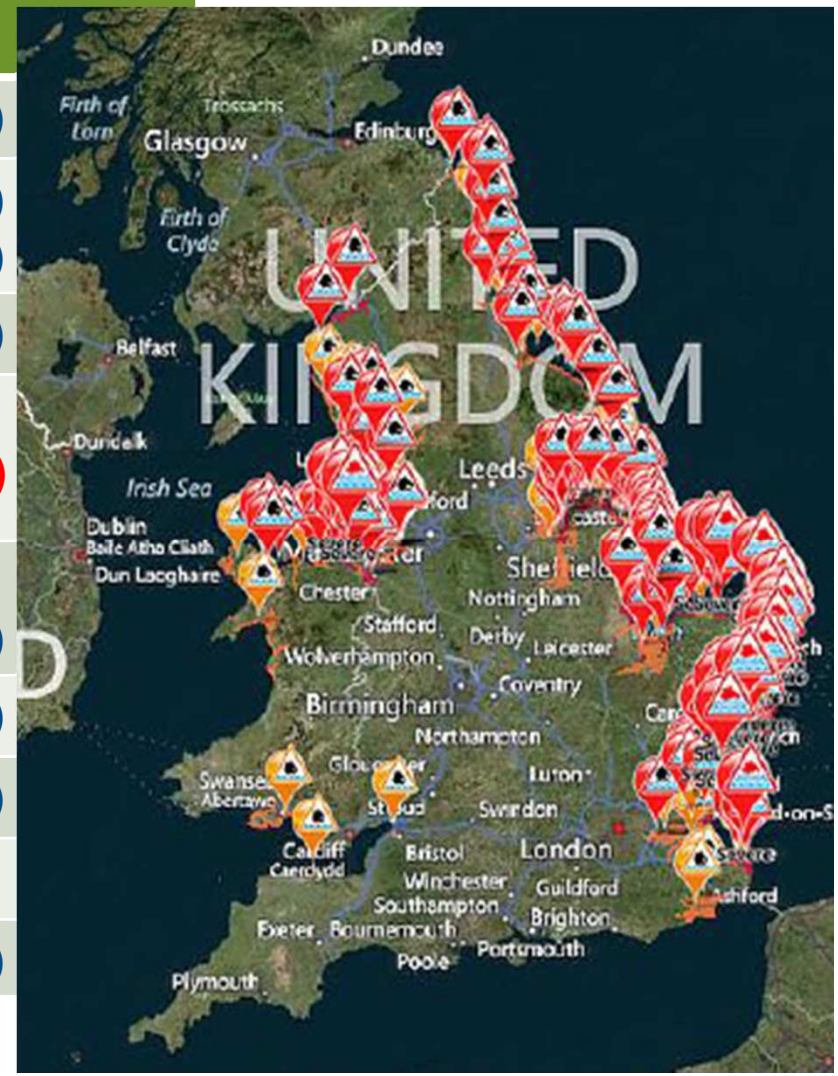
'Severe Flood Warnings' (Danger to Life) issued at 2.30am

Friday 5th

Concern re open breach in Boston

Unprecedented number of ‘severe flood warnings’

Location	Forecast Level (pm Thursday 5 Dec)	Past High Levels
North Shields	3.6	3.67 (‘53)
Whitby	3.8	3.70 (‘53) 3.66 (‘83)
Hull	5.4	4.95 (‘53)
Immingham **(Lincolnshire’s reference point)**	**4.9** **(actual 5.2metres)**	**4.7 (‘78)** **4.83 (‘83)**
Great Yarmouth	2.8	2.8 (‘07) 2.67 (‘93)
Harwich	3.4	4.02 (’78)
Southend	4.1	4.68 (‘53)
Sheerness	4.7	4.9 (‘53)
Rye	5.0	4.93 (‘95)



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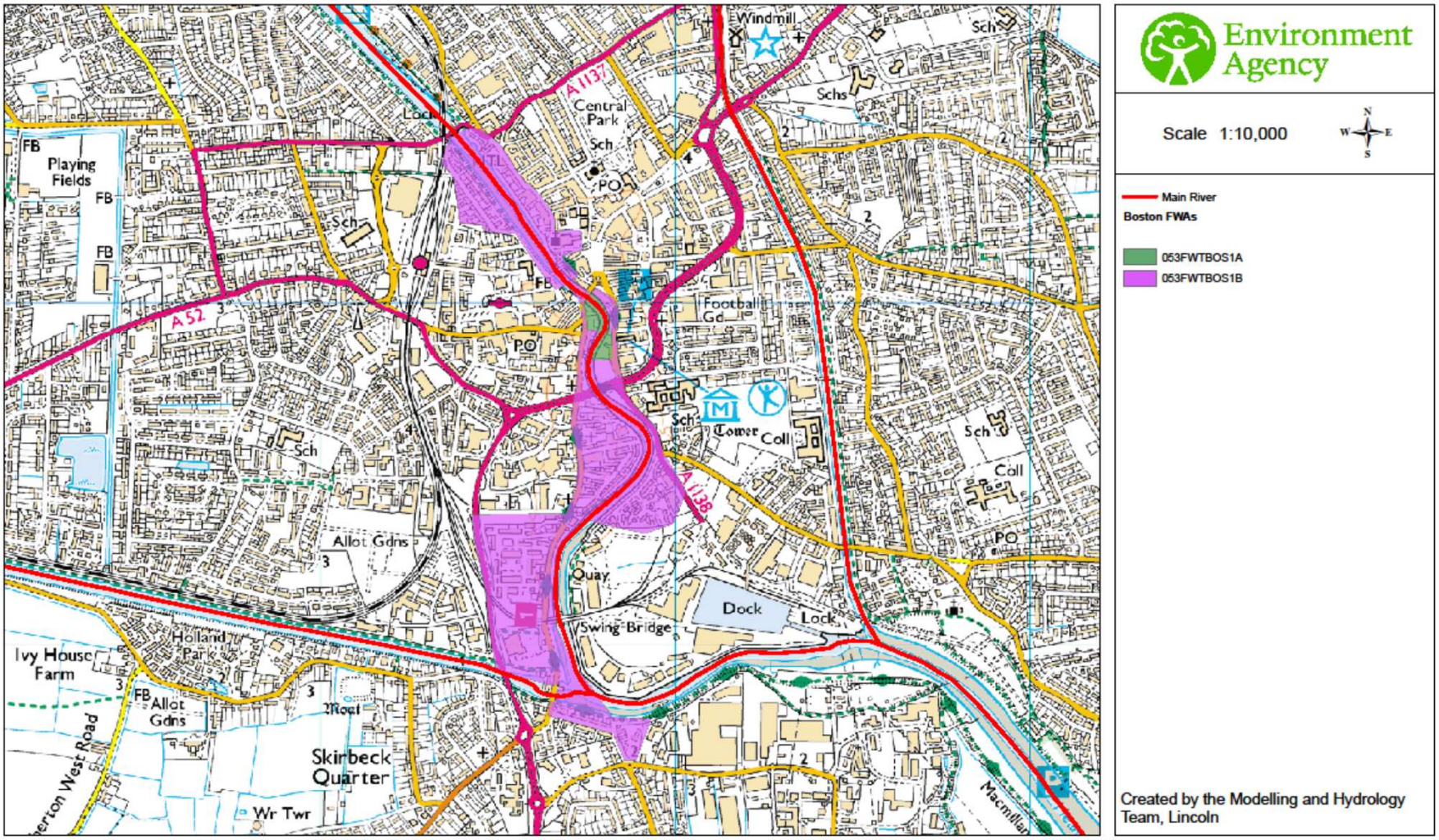
Flood warning areas at risk

Boston FWAs - BOS1A and BOS1B
Created December 2013



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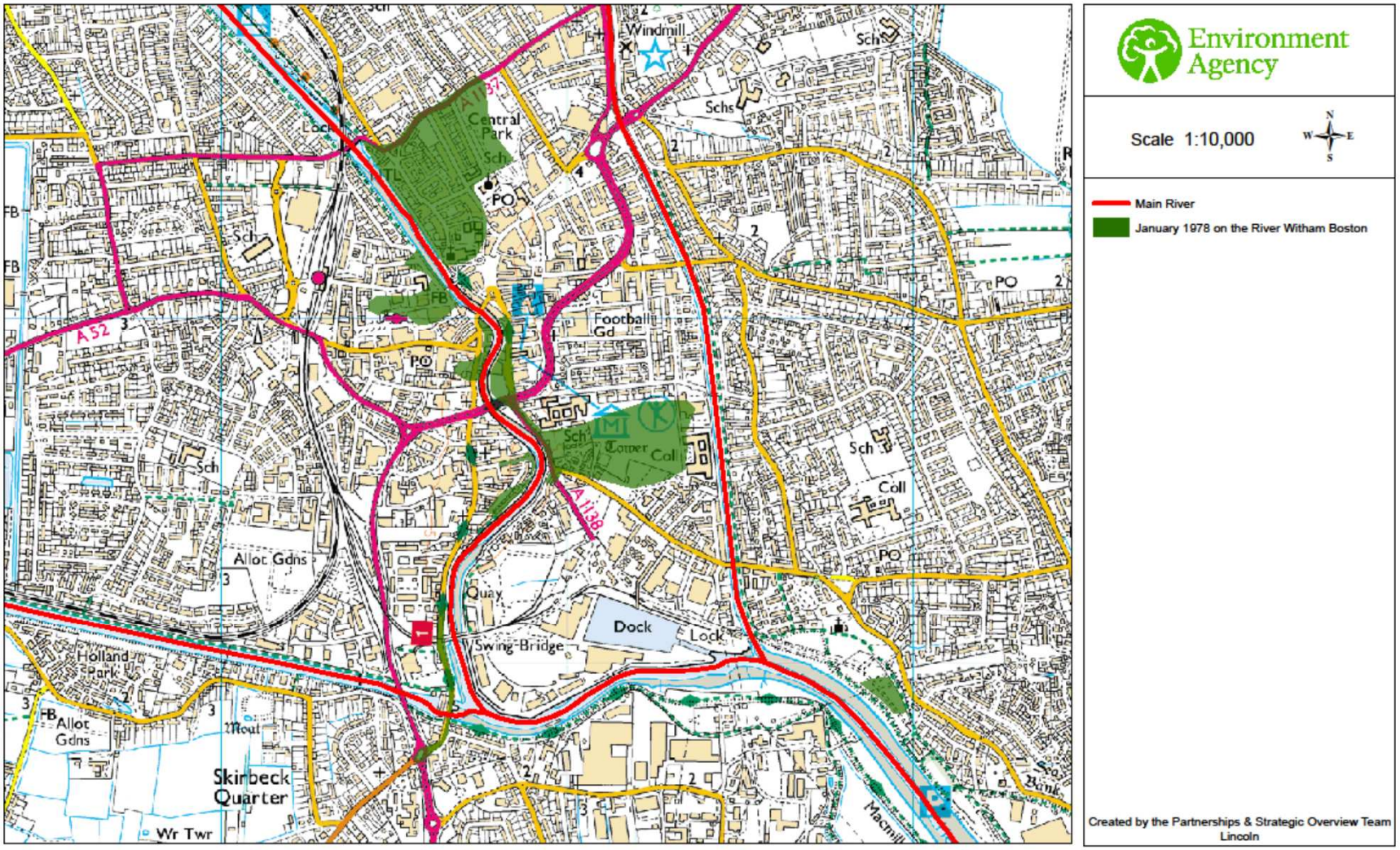
Historical flooding in same area

Historic Flood Extent Map - January 1978 on the River Witham Boston
Created December 2013



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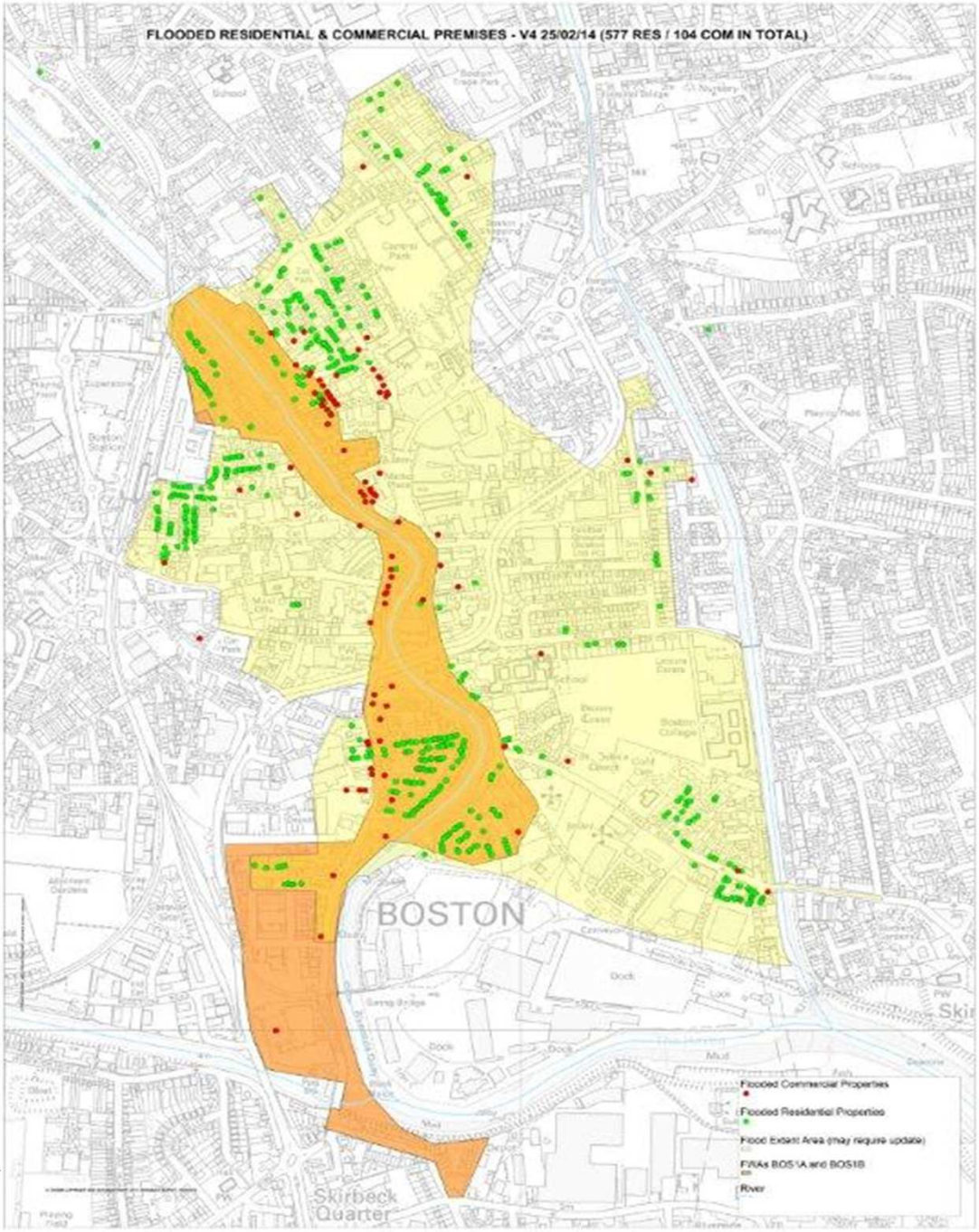
Flooding in Lincolnshire

(This slide is marked ‘OFFICIAL-SENSITIVE’)

Impacts were largely consistent with predictions made by EA as early as the Wednesday …

… Tidal Trent flooded, as did parts of coastline …

But main impacts in Boston



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Challenges in Lincolnshire

- Learning from surge, and ‘St Jude’ storm, in October
- Affecting everyone from Northumbria to Kent – ‘national’ coordination required
- Ensuring planning and response ‘proportionate’ to risk?
- Although lower ‘likelihood’ than everywhere else! … we anticipated increasing risk & activated contingency planning
- Flood rescue capability significantly enhanced in recent years
- Everyone to our north reporting (live) higher than predicted surges!
- First use of social media during emergency – BBC embedded in CEC continued to work well
- Additional challenge of Lincoln Christmas Market (200,000 visitors) and a major power cut in Lincoln (including CEC!)

Response in Lincolnshire

Three key strategies;

- Pre-deploying assets (including ‘preserving’ assets on the coast, and accessing specialist resources)
- Removing people from danger, and
- Protecting the infrastructure and essential services …

… *saves lives*!

Response in Lincolnshire

- EA assessment gave 3 x evacuation scenarios;
  - » 600 (likely)
  - » 18,000 (possible)
  - » 36,000 properties ‘at risk’ (‘worse-case’)
- ‘Required time’ versus ‘available time’ was against us
- Deployed 2 multi-agency ‘surge task-forces’ to Boston & Louth
- Planning assumption that 15% would need help
- Evacuation ‘hub’ in Boston and 2 x ‘strategic’ evacuation centres (Commercial & MOD); care homes and hotels used for VPs;
- Capacity for 2,000 in Lincs; Neighbouring counties on ‘stand by’
- 30 buses available over 2 days
- Identification of vulnerable persons and vulnerable assets
- Port of Boston, Pilgrim Hospital, Black Sluice Gate, Boston Stump … all ‘at risk’

Impacts in Lincolnshire

- Vulnerable people moved well in advance (but, only those we know about – some did not get help)
- High area for HMO and migrant workers
- 203 people, from 78 different households, received assistance to evacuate (13.5%)
- Numerous more self-evacuated
- We don't know how many stayed 'in-situ' (we know some ignored warnings)
- 44 people and 2 pets were rescued
- Far too many people exposed themselves to risk at flood walls
- 607 residential properties flooded (majority in Boston where only 50% had insurance)
- 121 businesses flooded

Boston, Lincolnshire – 5 Dec 2013

Boston (6.12.13) - 350 tonnes flood contaminated waste disposed

Boston Stump flooding – 5 Dec 2013

The most expensive sandbag!

Seal Sands, Billingham – 7 Dec 2013

Immingham Docks – 6 Dec 2013 09:48 GMT

Mablethorpe – 20m of sand-dune lost

Boston, Lincolnshire – 6 Dec 2013

Boston, Lincolnshire – 6 Dec 2013

Properties flooded since the start of December 2013

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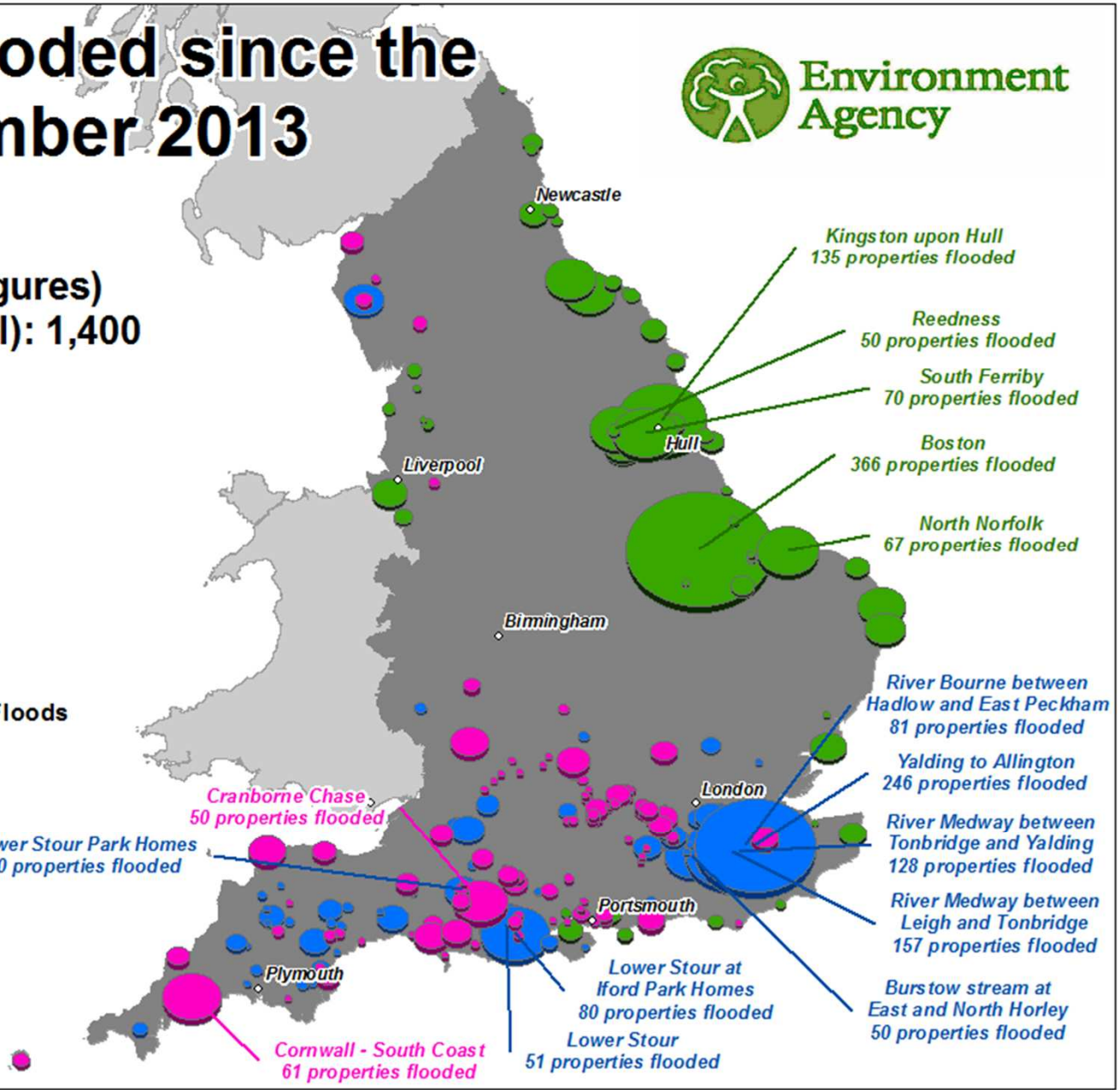
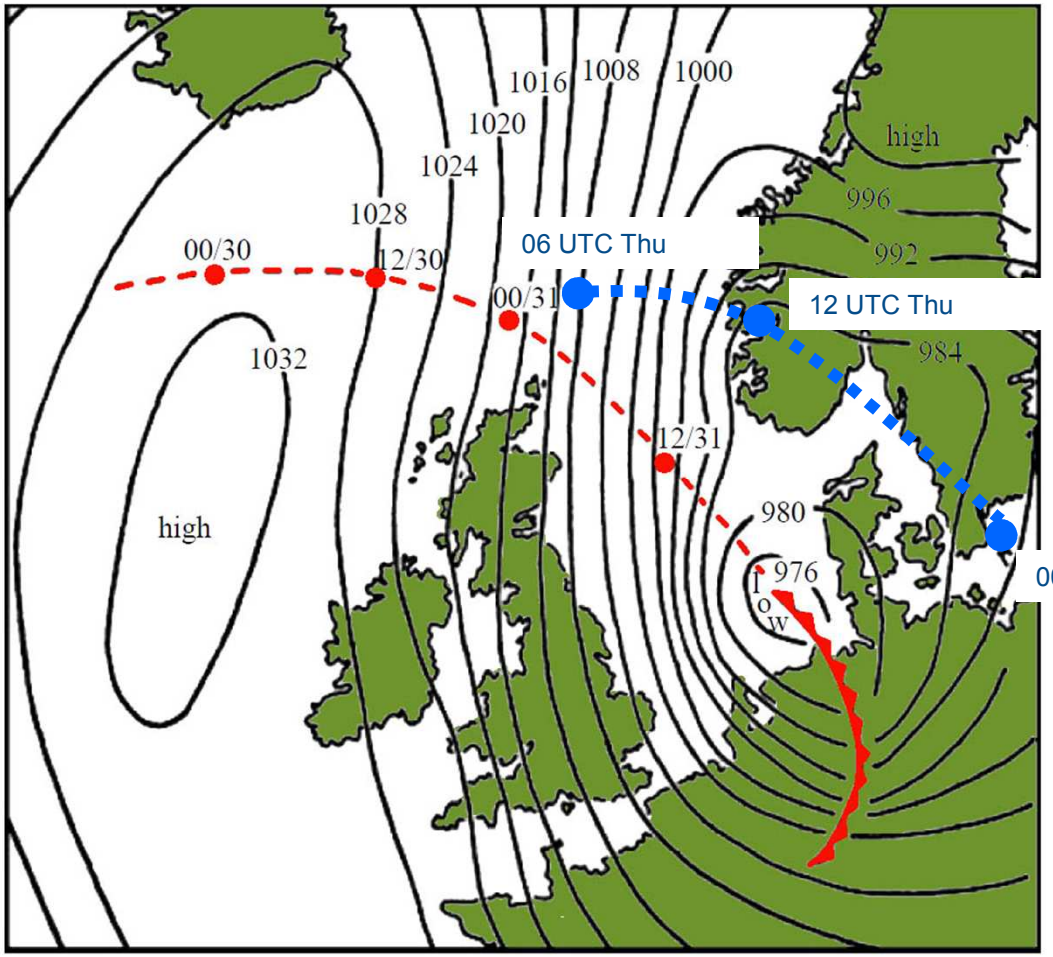
Approximate numbers of properties flooded (Environment Agency figures)
Early December (Coastal): 1,400
Late December: 1,400
January: 638
Map Compiled:
12 January 2014 10h23



Track of, and isobars of 1953 storm relative to 5th December 2013



Red line track & low pressure pattern of **1953 storm**

Blue dashed line is low pressure centre track **5-6 Dec 2013**

Comparison of East Coast Surges

	January 1953	December 2013
Breaches	120 major	4 major
Properties flooded	24,000	1,400
Deaths	307	0 (but 2 killed due to high winds inland)
Agricultural Land flooded	65,000 hectares	6,800 hectares
People evacuated	32,000	18,000
Infrastructure	2 Power stations 12 Gas Works 100 miles of roads 200 miles of rail	Major impacts at Immingham Port No power stations and major gas works/services affected
Flood Warnings	0	64 severe flood warnings Over 160,000 warning messages sent directly to homes and businesses

In the circumstances … a very good, forecast-led, response and recovery

We were …

- ***Better protected*** (by and large the defences and drainage system did their job)
- ***Better prepared*** (we certainly got ahead of the surge and responded well to a late developing threat)
- Households, businesses and key partners were ***better informed*** as a result of accurate forecasting and flood warnings

However, we were lucky (favourable wind – no persistent rain). This was not an event on scale of 1953 storm **… but it was a very useful and timely reminder!"**

Lessons learned …

- Capacity and resilience of partners tested to limit
- Welfare and rotation of responders (command and operational)
- Need for a secure, web-based, information sharing platform to improve communication
- Better cross border communication with EA re the Trent
- Identifying and supporting vulnerable people (good and bad experiences)
- Management and coordination of ‘emergent’ volunteers
- Non-emergency services ability to deliver capabilities ‘out of hours’
- Evacuation planning (especially roles & responsibilities)
- We must continue to invest in resilience and maintain our critical services as category 1 & 2 responders (in alliances)
- We must continue to invest in protection and vulnerability reduction