APPENDIX 1

HISTORY OF FLOODING SOURCES

The following description of flood events has been collated from a variety of sources including newspaper articles, published texts, social media posts and anecdotal evidence from news reports. This list is not exhaustive, but serves to indicate the frequency of significant flooding occurring in Boston in recent history, and the disruption experienced by the community as a result. These events are listed chronologically, with further details of wider regional events summarised at the end.

1 1779 event

1.1 The British Hydrological Society maintains a register of significant hydrological events. Their webpage titled the Chronology of British Hydrological Events documents an event in 1779 in which tidal flooding effected Boston, summarised in the table extract following.

Table A1-1.1: 1779 Event Details, Table Extract

<table>
<thead>
<tr>
<th>Event Details</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
<td>14310</td>
</tr>
<tr>
<td>Year</td>
<td>1779</td>
</tr>
<tr>
<td>Month</td>
<td></td>
</tr>
<tr>
<td>Day</td>
<td></td>
</tr>
<tr>
<td>Calendar</td>
<td>New</td>
</tr>
<tr>
<td>Quotation</td>
<td>&quot;The 18th century saw several serious floods in the Boston area; in 1779 the lower part of Boston was &quot;overflowed by the tide;&quot; and in 1807 water was one foot deep over floor level and in 1810 whole streets completely inundated and flooding affected the whole area from Wainfleet to Spalding.&quot;</td>
</tr>
<tr>
<td>Source</td>
<td><a href="http://www.enderbymuseum.ca/thepast/geog/hightides.htm">http://www.enderbymuseum.ca/thepast/geog/hightides.htm</a></td>
</tr>
<tr>
<td>Area</td>
<td>030 - Witham and Steeping</td>
</tr>
<tr>
<td>Contributor</td>
<td>Frank Law</td>
</tr>
<tr>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Related URL</td>
<td></td>
</tr>
<tr>
<td>Geo Reference</td>
<td></td>
</tr>
</tbody>
</table>

November 1810 event

An event in 1810 documented in an article on Lincolnshire Live titled 200 years since flood to end all floods... is a collation of evidence from the Boston Gazette and the Stamford Mercury prepared by historian Hilary Healey. The following list paraphrases the key measures of the flooding event:

2.1.1 AS many as 10 people may have died during the great flood of 1810, which engulfed the area in the pitch black of night and without warning.

2.1.2 The following is taken from the Boston Gazette, which reported on the flood three days after the disaster.

2.1.3 "On Saturday morning, about seven o'clock, it began to rain at Boston and continued to do so throughout the day. From 11 o'clock in the day 'til six in the evening, it blew extremely hard; and from that hour 'til nine, a perfect hurricane.

2.1.4 "The tide in the evening came in with great rapidity and rose, half an hour before the expected time of full flood, to a height exceeding by four inches what it is recorded to have attained on any occasion preceding.

2.1.5 "Houses, which on no occasion whatever before had been invaded by the tide, were now, by its over-pouring all probable bounds, filled to a great depth with the water, which rushed into kitchens and cellars, and inundated every apartment until it found its level.

2.1.6 "Whole streets were thus circumstanced. The performance of divine service on Sunday in the parish church, Boston, was prevented by the tide on the preceding evening having completely flooded the area appropriated to public worship.

2.1.7 "The height of the water against the western end of the steeple, was two feet eight inches and a half. Friskney new sea bank was broken by the tide in two or three places; Leverton new sea bank the same; of the Freiston new bank scarcely a vestige was left; as was Boston East old bank, and the banks at Skirbeck Quarter, Wyberton, Frampton and Fosdyke.

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2 This is Lincolnshire. (2010, November 10). 200 years since flood to end all floods... Retrieved from Lincolnshire Live: http://www.lincolnshirerlive.co.uk/200-years-flood-end-floods/story-11195470-detail/story.html
2.1.8 “The old sea banks, unhappily for the country, have proved insufficient in height, as the surge passes over them almost along the whole line: and this was the cause of the breaches – the overflow having first scoured away the banks, from the summit to the base, on the land side.”

2.1.9 “The situation of the country, in consequence, from Wainfleet almost to Spalding, a distance of 30 miles, is such as exceeds our powers of description. The hotel at Freiston Shore was for some hours in danger of being quite washed down; the great bow window of the dining-room although a considerable height from the ground, was forced from the building by the water, and carried to the distance of several fields. Dead sheep are seen lying in numbers from every road that is passable.

2.1.10 “The roads from Boston towards the sea at Fosdyke Wash are nearly impassable, being horse-belly deep in water, and the communications along the sea banks are cut off by the breaches in them.”

2.2 The above research by Hilary Healey is supplemented by further documentation on the event in 1810, recorded by the Chronology of British Hydrological Events and presented in the table extract below. The information was originally reported by the Lincolnshire Standard in 1944 and summarised by M Shirley.

<table>
<thead>
<tr>
<th>Event Details</th>
<th>1810 Event Details, Table Extract</th>
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<tbody>
<tr>
<td><strong>ID</strong></td>
<td>7153</td>
</tr>
<tr>
<td><strong>Year</strong></td>
<td>1810</td>
</tr>
<tr>
<td><strong>Month</strong></td>
<td>11 (November)</td>
</tr>
<tr>
<td><strong>Day</strong></td>
<td>10 (Saturday)</td>
</tr>
<tr>
<td><strong>Calendar</strong></td>
<td>New</td>
</tr>
<tr>
<td><strong>Quotation</strong></td>
<td>1810 November 10 [As summarised by M. Shirley in the Met. Magazine, March 1947 issue, p 65/66] &quot;... at South Kyme, some 10 miles west-north-west of Boston the total for November 1810 was 5.94 in., which is not a very arresting figure. The graphic account describes how an extraordinarily strong ENE gale, accompanied by continuous rain, gathered up strength in the course of the day. It was the day before full moon and a high tide was expected in the evening, but by five in the afternoon the storm was at its height and it raged for two hours. &quot;Vessels lying in the river Witham between the bridge and Skirbeck Quarter rolled gunwhale under&quot;, - a circumstance never before witnessed there and all the more significant when one remembers that this part of the river is about four miles from the sea. Several vessels off the coast were lost with all hands, and the flood-tide brought havoc on land. For nearly an hour the flood-tide appeared to be stationary as the waters surged relentlessly forward up the river and over the sea walls. Nothing like it within living memory had been seen before on that coast. About 8 pm, it began to ebb. The force</td>
</tr>
</tbody>
</table>

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of the water broke down not only the ancient sea banks, but also newly constructed sea banks, inundating farm lands and buildings and dwelling houses. Many people sought refuge in the rafters of their houses until rescuers came by boat.” Mr H.W. Wheeler, in "History of the Fens", published in 1868, quotes a fuller account of this disaster, together with notes on earlier and subsequent floods.

<table>
<thead>
<tr>
<th>Source</th>
<th>The Lincolnshire Standard of January 1, 1944</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td>030 - Witham and Steeping</td>
</tr>
<tr>
<td>Contributor</td>
<td>Frank Law</td>
</tr>
<tr>
<td>Reference</td>
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<td>Related URL</td>
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<tr>
<td>Geo Reference</td>
<td></td>
</tr>
<tr>
<td>Entry Date/Time</td>
<td>01/12/1998 09:46:49</td>
</tr>
</tbody>
</table>

3  **February 1949 event**

3.1  Information on historical coastal surges has been collated by the University of Southampton and is summarised in a list maintained on their website titled Surge Watch. One source listed by surge watch is Zong (2003) ([Appendix 1.1](#)), a journal article supporting comments from other sources including newspapers and Meteorological Data sources for many events including February 1949.

3.1.1  There were “exceptionally” high tides in the Thames Estuary (Met Office, 1949). Within the national tide gauge network, only the three tide gauges (Newlyn, Aberdeen and North Shields) were operational at the time. At these sites the return periods were less than 1 year. At North Shields the maximum skew surge was 0.81 m. The event occurred at peak spring tides.

3.1.2  A North Sea storm surge was associated with serious flooding in many locations in southeast England, including London, Sheerness, Margate, Ramsgate, Southend, Whitstable, Sheerness, Boston and King’s Lynn (The Times, 1949; Zong and Tooley, 2003). This event was described as the worst flooding in 65 years.

3.1.3  There was considerable damage to coastal defences with extensive lengths of sea walls cracked, crests damaged, backing material washed out, and even some breaching.
January to February 1953 event

4.1 The following accounts and statistics from Boston flooding in 1953 is documented by Boston Borough Council on their website; Boston Borough Council, 2014.

4.1.1 The major flood caused by a heavy storm occurred on the night of Saturday, January 31, and the morning of February 1, 1953. A combination of a high spring tide and a severe windstorm caused a storm tide. The tidal surge overwhelmed sea defences and caused extensive flooding. In England 307 people died - 42 in Lincolnshire. Norfolk, Suffolk and Essex also had fatalities and 19 died in Scotland. But across the North Sea the Netherlands was hit the worst, recording 1,836 deaths.

4.1.2 The focus for events will be at Mablethorpe, Ingoldmells and Skegness, which were the worst affected places. There was flooding in Boston borough, but no severe damage and no loss of life. In fact flood water markings on the Stump show that there was a more severe incident as recently as 1978.

4.1.3 There were 1,200 different breaches of sea defences and 32,000 people had to be evacuated, 24,000 homes were flooded and 100 miles of roads were impassable. A total of 160,000 acres of agricultural land was inundated and not usable for several years and 46,000 head of livestock were lost.

4.1.4 Damage at 1953 prices was £50 million - more than £976 million at today's prices.

4.1.5 Flood defences have been improved since 1953 and although the likelihood of it happening is low, the effects could be far-reaching and severe which is why flooding remains the highest risk factor for many in the updated county Community Risk Register.

4.2 Baxter (2005) (Appendix 1.2) provides further statistics and accounts of the major flooding in 1953, with the following quotes as summarised by SurgeWatch:

4.2.1 No loss of life was recorded in Boston “The flood struck the coastline with a sudden onset and without warning. Of the 307 deaths, at least 216 (70%) occurred in five main clusters: Mablethorpe and Sutton-on-Sea (16 dead), Hunstanton and Snettisham on the Wash (65 dead), Felixstowe and Harwich (over 40 dead), Jaywick (37 dead) and Canvey Island (58 dead).”

4.2.2 The sea forced its way into the beach bungalows and chalets whose flimsy walls provided no defence. Some bungalows by the shore simply fell apart as the water struck, immediately drowning the occupants.

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Others floated intact, one with its occupants inside for hundreds of metres. As the water rose, people grabbed ladders or climbed into lofts or onto roofs, where they held on in the freezing wind, grasping chimney pots or rooftops. Some were reported to have slipped back into the water as they became too cold to hang on. The fast-flowing water contained a vast array of debris, including trees, which were capable of battering gaping holes in the brick walls of some houses. The lives of those waiting for rescue in the cold darkness upstairs or in their lofts also depended upon the structure holding up against the undermining action of the water. People who found themselves in the water, or who tried to rescue others, were buffeted, knocked down or injured by the floating debris.

4.2.3 This refers to flooding in King’s Lynn and Canvey island respectively but it makes good reference to the flood hazard for single-storey properties and vulnerable population demographics:

(a) “…the water flowed across a field towards a row of terraced, brick houses Holkham Street in which five of the elderly victims lived and who were ground floor at the time. The houses were not severely damaged, but the had nowhere else to go but to pile up against the external walls and then force way in. She was in her sitting room and, in order to escape, would have needed move quickly and open the inside door that led to the stairway and the rest house against the weight of the incoming water. Being elderly and frail, was obviously too great as the water filled the room, leaving a watermark below the ceiling.”

(b) “The sea first broke in through the South Benfleet Creek in the Sunken Marsh area northeast of the island where 53 of the 58 flood victims died. This area contained a high proportion of the vulnerable houses: the water would have rushed into the single-storey homes and surprised people in their beds. Some drowned immediately and others escaped to the rooftops or inside roof spaces. The five deaths outside this locality were attributed to exposure.”

4.2.4 The sanitary network also failed due to the flooding of the pumping stations and loss of power, so that normal sewage processing ceased for 17 days. A programme of inspection and flushing through of the drains was begun when the flood-water subsided. Household food had been contaminated by the flood-water as well, and sanitary workers began an urgent inspection and disposal programme, together with advice being issued to householders on food hygiene.

4.2.5 The outcome of these public health measures was that there was not a single case of dangerous infectious disease reported. When the damaged and mud-filled houses were being cleaned out and resettled in the weeks after the flood, sanitary workers regularly inspected the affected properties and provided advice.
5 January 1976 event

5.1 A storm surge on the east coast of England in 1976 documented by Bayliss-Smith et al (1979) (Appendix 1.3) was another significant tidal event, however flooding in Boston was not documented.

5.1.1 Table 1 shows that in 1976 tidal levels were broadly comparable with the 1953 event at Boston dock but up to 0.18m lower at Grand Sluice.

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6 January 1978 event

6.1 Another event documented on their website by SurgeWatch in 1978 involved flooding in Boston. Various sourced are quoted by SurgeWatch, collating information into a summary of flood effects.

6.1.1 The storm generated a 0.98 m skew surge at Immingham and a 1.18 m skew surge at Lowestoft (these are the only two North Sea sites from our database that were recording data at the time). A sea level return period of 1 in 27 years was recorded at Immingham and 1 in 7 years at Lowestoft. Other reports indicate that on parts of the UK coast

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(Lincolnshire and Humber regions), the high water was higher than in 1953, for example a high water height of 5.92 m (above Ordnance Datum Newlyn) was recorded in Kings Lynn compared with 5.65 m in 1953 (Steers et al. 1979). Conditions in the Wash (Lincolnshire) were worse than in 1953; since the wind and surge were locally magnified by this feature (Steers et al., 1979).

6.1.2 The event caused damage to the transport infrastructure, with significant affects to the railway line between Grimsby and Cleethorpes.

Figure A1-6.1.2: 1978 event details, flood damages extract

In the Humber and along the Lincolnshire coast, tidal levels were higher than in 1953 and 1976: the height above predicted tidal level in 1953 was 0.72 m more than in 1976 and 1978 but was on a lower tide. The warning system worked reasonably well except on the northeast coast (Richards, 1978), so that flood warnings were issued some two to three hours before the maximum in the coastal towns of Lincolnshire. Flooding, however, was locally serious. In Cleethorpes about 1000 houses were seriously affected over an area of five km² behind defences. The railway line between Grimsby and Cleethorpes was put completely out of action because hundreds of tons of ballast were washed from under the track, which runs close to the coast for over a kilometre before it reaches Cleethorpes station. Over a short distance the track itself was seriously displaced.

6.1.3 Flooding of Boston without prior warning as experienced peak was higher than the predicted peak:

Figure A1-6.1.3: 1978 event details, flood damages extract

and twisted. At Sandilands and Mablethorpe, 28 houses and 8 business premises were flooded, and chalets and caravan sites suffered at Trusthorpe, Ingoldmells and one or two other places. At Boston, the church and 180 houses were flooded owing to the collapse of a brick wall. No warning was given at Boston since the predicted surge was 0.84 m, but unfortunately it reached 1.2 m. At Skegness, the sea bank to the north of the pier was unbroken, but there was much loss of sand from the beach in front of it. The pier, about 900 m long, suffered severe damage. It was built in 1881 and, as at Hunstanton, the far end on which the theatre stands was left isolated by a gap more than 100 m wide. Table 1 shows that in 1978 conditions in the Wash were worse than in 1953: the Wash acted as a wide funnel into which the wind and surge mounted to a maximum. Similarly, in the dyked

6.1.4 At Boston, the church and 180 houses were flooded owing to the collapse of a brick wall.

6.1.5 No warning was given at Boston since the predicted surge was 0.84m, but unfortunately it reached 1.2m.

6.1.6 The Table 1 extract in Figure A1-6.1.6 below shows that in 1978 conditions in the Wash were worse than 1953: the Wash acted as wide funnel into which the wind and surge mounted to a maximum.
STORM SURGE ON THE EAST COAST IN 1978

TABLE I

Water levels during the storm surges of 1953, 1976 and 1978 (metres O.D.)

<table>
<thead>
<tr>
<th></th>
<th>31 Jan 1953</th>
<th>3 Jan 1976</th>
<th>11 Jan 1978</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wick</td>
<td>–</td>
<td>–</td>
<td>3.86</td>
</tr>
<tr>
<td>North Shields</td>
<td>3.32</td>
<td>3.43</td>
<td>2.81</td>
</tr>
<tr>
<td>Barton on Humber</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>South Ferriby</td>
<td>4.79</td>
<td>5.3</td>
<td>4.4</td>
</tr>
<tr>
<td>Immingham</td>
<td>4.50</td>
<td>4.50</td>
<td>3.71</td>
</tr>
<tr>
<td>Grimsby</td>
<td>–</td>
<td>4.35</td>
<td>3.4</td>
</tr>
<tr>
<td>Boygrit</td>
<td>–</td>
<td>4.3</td>
<td>3.2</td>
</tr>
<tr>
<td>Boston Dock</td>
<td>5.25</td>
<td>5.24</td>
<td>4.3</td>
</tr>
<tr>
<td>Boston Grand Sluice</td>
<td>5.40</td>
<td>5.22</td>
<td>–</td>
</tr>
<tr>
<td>Fosdyke</td>
<td>ca 5.4</td>
<td>5.18</td>
<td>4.3</td>
</tr>
<tr>
<td>Woldgate</td>
<td>ca 5.1</td>
<td>4.99</td>
<td>4.3</td>
</tr>
<tr>
<td>King's Lynn</td>
<td>5.65</td>
<td>4.99</td>
<td>4.37</td>
</tr>
<tr>
<td>Wells</td>
<td>3.13</td>
<td>4.46</td>
<td>3.1</td>
</tr>
<tr>
<td>Great Yarmouth</td>
<td>3.28</td>
<td>2.69</td>
<td>1.1</td>
</tr>
<tr>
<td>Southwold</td>
<td>3.50</td>
<td>2.50</td>
<td>1.4</td>
</tr>
<tr>
<td>Aldeburgh</td>
<td>3.78</td>
<td>2.83</td>
<td>1.4</td>
</tr>
</tbody>
</table>

6.2 Boston Target (2013)\(^6\) reported statistics on the 1978 flooding observations relative to the 1953 event:

6.2.1 Waters [in 1978] in the church exceeded the levels seen in 1953.

7 December 2013 event

7.1 The Lincolnshire Resilience Forum comprises members from Lincolnshire Police, Lincolnshire Fire and Rescue, EMAS, local authorities, the Environment Agency, health agencies and the voluntary sector. The Lincolnshire Resilience Forum March 2014\(^7\) session reviewed the flooding of 2013, providing accounts and statistics of flooding:


7.1.1 Slide 3: A year that started with 60th Anniversary of ‘Great Storm’ of 1953...ended with the largest surge since, and greatest test of responders.

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

7.1.2 Slide 9 OFFICIAL SENSITIVE: Main impacts in Boston 577 res/ 104 com [ 577 residential properties affected/ 104 commercial properties affected] based on flood extent dated 25/02/14 with not to state this may require update.

7.1.3 Slide 13: majority [of residential properties flooded were] in Boston where only 50% had insurance

7.1.4 Slide 15: Boston (6.12.13) - 350 tonnes flood contaminated waste disposed

7.1.5 Slide 22: Boston 366 properties flooded [since the start of December 2013]

7.2 A press release from the Environment Agency, UK Government8 summarised details of the 2013 flooding and repair work to defences:

7.2.1 The flood defence was breached when high tides combined with a tidal surge on 5 December 2013 to produce the highest water levels ever recorded in the Haven, flooding the landfill site and commercial properties on Riverside Industrial Estate.

7.2.2 Water was 6.08 above ordnance datum. Higher than the floods in 1953 and 1978.

8 Reference gauge at Immingham, Lincolnshire. Class A BODC gauge.
7.2.3 The Environment Agency did an initial repair to the damaged defence in December 2013 using sheet piles and 2,000 tonnes of stone to plug a 45 metre gap to reduce the risk of further flooding.

7.2.4 Permanent repairs will now be carried out to the flood bank. The Environment Agency also plans to increase the width of the bank to 4 metres and the height to 7.3 metres above ordnance datum (the universal benchmark against which tides in Great Britain are measured).

7.3 The flood event and anecdotal accounts were also documented by BBC News, 2013\(^{10}\).

7.3.1 About 200 Boston residents are still waiting to return to their homes after flooding hit large parts of the town. Boston Borough Council said the majority of those affected were staying with friends and family, with some being put up in local hotels.

7.3.2 On Friday, people in nearby Wyberton were also told to prepare to leave their homes after damage to the flood defences was identified. However, engineers managed to repair the damage ahead of the evening's high tide.

7.3.3 Volunteers calling themselves the Boston Clean Up Crew have been on the streets supporting the clear-up operation.

7.3.4 Resident Neil McCafferty said water was "literally pouring down the streets" on Thursday. "It is like a tidal wave coming down. It is something else," he said.

7.3.5 Mayor of Boston Paul Kenny said: "It's an experience that I hope we don't ever see in Boston again. "Hopefully we can get people's lives back together in the run up to Christmas."

7.3.6 Fundraising manager Peter Coleman said the [St Botolph's] church, which had recently undergone a major renovation project, had about 2ft (0.6m) of water inside and 4ft (1.2m) outside the building. "It's a rather devastating situation," he said.

7.4 An article on BBC News by Dave Wade titled Boston floods: A year on from the tidal surge\(^ {11} \) reviewed and summarised the 2013 event, grouped below by source of flooding evidence:

7.4.1 Mr Hugh Drake, Farmer, Friskney:

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Unlike much of Boston itself, the landscape at Friskney - just outside the town - remains waterlogged, and it is here the severity of the flooding 12 months ago can still be seen.

"I can only say that it was the worst day of my life. I don't think I've ever known such a feeling of shock and apprehension and fear," says Mr Drake. "Everything that I have tried to do over the years was just gone. It was a very depressing moment."

The farmer was forced to build a new sea bank behind the original one, which was damaged by the sheer volume of water. And he has permanently lost a large section of land to the sea. He is also unable to grow crops in the flooded area for up to two years because of the high levels of salt.

"I shudder to think what the actual cost is in terms of lost production," he says. "But we recover from that and press on and do what we can to return the land to its former productivity. I've lost 25 acres of land. The soil to build the new bank has come from that 25 acres. That piece of land will be allowed to become tidal. It will silt up and re-establish as a green marsh."

"I'm ringing my customers saying don't come in, we're flooded. 'Oh very funny', they said. Everyone thought it was a joke," says Jo Christmas, co-owner of the restaurant in Wormgate in the town centre.

Having been warned 12 hours earlier of the tidal surge, the restaurant was prepared - everything that could be moved upstairs was moved.

"Sure enough a lot of water hit the street. We're very fortunate that as an Italian restaurant it looks right for us to have tiles all the way through. "It was in and out of the street quite quickly but as soon as it left, the doors were open and we swept it out."

Frequent media reports of Boston's floods led many to assume shops were shut, Ms Christmas says. "It wasn't really the water that hurt the trade in December it was that everyone thought we were still shut and that was really hard to combat. "We tried getting the word out there, ringing our existing bookings but unfortunately many had already booked other restaurants thinking, 'There's no way they'll be open'."

The Boston Standard newspaper was badly affected, but editor Stephen Stray says they are back up and running normally now.

Dewhursts Trophies in Nelson Street was another. Employee Chris Bonner says that with help from neighbouring air cadets and other shop workers, they were back open the next day.
But it was months before conditions were dry enough for a new carpet to be laid and dehumidifiers to finally disappear.

7.4.5  St Botolph's Church (also known as Boston's Stump)

Roughly £1m of damage was caused to St Botolph's, with extensive repairs needed to the heating system, electrics and pews, as well as its cafe and shop.

The heating is still being fixed, according to Michael Bartlett from the church, with pipes soon to be replaced under the church floor. A team is working 12 hours a day on the repairs, but he says it was no easy task.

The results of an environmental survey should soon tell them how much damage the salt water has caused to the ancient stone work.

"The whole flood has been a real challenge for the team here, but it has led to us working closer with some of our local businesses and the community," Mr Bartlett says.

On Friday, an event is being held to celebrate the resilience of traders in the town centre who carried on despite the flood.

7.4.6  Leighton's account, residents.

Some, like Mike and Pat Leighton, decided to stay at home. The ground floor of their Tower Street house was 18 inches (46cm) underwater on the Thursday night.

They moved what belongings they could grab upstairs but Mrs Leighton says that for five months afterwards they were "upside down".

"We didn't have a Christmas last year."

"About a foot to 18 inches all the way round the house - carpet, furniture, we lost everything."

Mrs Leighton is being treated for an infection in her nose, which her doctor told her is a result of the dirty floodwater. "It was obviously a germ in the water, in the muck, that got into my system because I was very poorly afterwards," she says. "We both got poorly because of whatever the water brought into the house."

"I wished I had took a little bit more notice of them telling us there was a flood warning, but like a lot of others we thought it's not going to happen," says her husband. "I don't think anybody thought it was going to come to that extent."
7.5 The Boston Standard\textsuperscript{12} reported the flood event and a summary of the consequences to the community:

7.5.1 7pm: People in Boston are being urged to stay safe as floods are now hitting the town - with the River Haven bursting its banks. The water has poured over the side of the banks of the river in the centre of the town and reached the Len Medlock Centre, with water running over the walls into the streets around The Standard’s office. The council offices in West Street have also flooded as water reaches the highest levels in living memory. Reports suggest John Adams Way is also flooded, making it difficult to pass through the town centre. Vulnerable people are being evacuated to the Princess Royal Sports Arena to avoid the flood and residents urged to stay upstairs. Buses are leaving from Asda, and Wide Bargate to take people to the PRSA.

7.5.2 Pumps are currently in place on John Adams Way, Norfolk Street. “9.30pm By about 7pm this evening the Haven burst its banks flooding streets throughout the town centre – with many people evacuated to the PRSA or urged to stay upstairs away from the water. The water flowed through Church Street, Wormgate, West Street and Boston Bus Station.

7.5.3 Police say that about 250 people will be spending a night in an ‘evacuation centre’, where they will stay for 12 to 18 hours. 21 have arrived so far with another 230 en route. Damage to Boston’s flood defences is being evaluated and a police helicopter is surveying the aftermath of the flood. A spokesman added: “There has been one reported casualty which is a person who suffered an asthma attack.

7.6 The Boston Borough Council website summarises accounts of the flood event on its webpage titled HEROES WHO DEFIED THE FLOOD\textsuperscript{13}. The following list summarised the key messages:

7.6.1 The breach in the primary sea defence at Slippery Gowt where the Board’s continuous pumping operation saved Wyberton and Frampton from potential flooding.

7.6.2 Black Sluice Internal Drainage Board Chief Executive Ian Warsap described how sea water rushed through the breach in the sea bank at Slippery Gowt and flooded into the area’s drains. A conservative total of 220 million litres (88 Olympic size swimming pools) was contained by the drains and pumped back into the Haven, much of which might


otherwise have flooded overland in the direction of Wyberton and Frampton.

7.6.3 Earlier in the year flood-resilience works at the pumping station ensured the pumps and ancillary equipment had been raised above any future flood water levels. Kirton Marsh pumping station has also had its pumps and associated machinery raised above anticipated flood levels ensuring they too can continue to operate during an emergency. New non-return valves allow for continuous pumping into The Haven even when the sea water levels are extreme.

7.6.4 They visited the Environment Agency's Black Sluice Pumping Station in Boston which had not fared so well. On the night of December 5 water poured through the walls flooding to a depth of 13 feet.

7.6.5 All five pumps were put out of action with damage from silt to gearboxes and floodwater damage to cooling pumps and electronics. Engineers inside watched in horror as flood water pouring from The Haven rose three feet up the outside of the windows. The lower floor at the pumping station, which houses equipment without which the pumps cannot operate, is about ten feet below. Orders had to be given to evacuate the building. Two of the five pumps, located at a higher level in the pump house, have been re-comissioned and are currently dealing with raised water levels in the South Forty Foot Drain. A standby generator, also housed above the flood level, is now in place to start the two operational pumps.

7.7 You Tube Primetime Media 14 has uploaded footage and provided comments on selected periods of interest showing the different impacts of flooding:

7.7.1 00:00 – 00:44 Footage of flooded streets, cars moving through the flood water, people wading through the flood water and abandoned flooded cars

7.7.2 00:45 – 00:56 Footage inside flooded houses showing flooded furnishings, the silt left behind and a candle positioned on a radiator implying electrical power it out.

7.7.3 00:57 – 01:10 Footage of water flowing out through open doorway to the property and waterfalling on the street below

7.7.4 01:11 – 01:20 Footage of two men sweeping out the flood waters through the same doorway and another sweeping out through the doorway of the neighbouring property.

7.7.5 01:21 – 01:30 Footage of a flooded food shop with two men clearing out soaked merchandise and moving others above the flood water.

7.7.6 01:31 - 01:39 Footage of man sweeping out flood water from a restaurant/cafe/bar where tables and chairs have been stacked up to avoid the flood waters

7.7.7 01:51 – 2:00 Footage of flood waters against a church door, identified as St Boltoph's Church but this is not confirmed in the audio or description below, and flooding around the church.

7.7.8 02:01 – 02:18 Woman sweeping flood water out of a laundrette shop

7.7.9 03:55 – 04:31 Footage water flood water and debris (leaves, stick etc.) in an elderly woman's house showing her picking up a soaked electronic goods in a box and view of her flooded lounge with soft furnishings, an electric fire and personal ornaments flooded out.

7.7.10 Comments to the above video:

(a) PrincessJuneex3 years ago “I live in the middle of town and my house is flooded like, crazy. It smells mouldy, we need new furniture, so for the time being we're moving into another house and apparently we can't go back to our house until April :( My Christmas is Ruined ...”

(b) Nicola Hall 3 years ago “My son and his family were flooded out. Absolutely devastating for people especially 3 weeks before Xmas”

7.8 You Tube: Boston Borough Council 15 uploaded footage of the flood event, with selected periods demonstrating flood mechanisms/paths.

7.8.1 01:07 – 01:31 CCTV footage of flood waters spilling over the top of the Haven banks to flood the street and properties in nearshot, shows deep and fast moving water

7.8.2 03:08 – 03:27 CCTV footage of street showing the speed of the flooding increasing up the road.

7.8.3 03:28 – view across John Adams Way to the right bank downstream, showing the flooded car park, street and houses beyond. Also shows how the water overtopped the right bank to South Terrace. A breach was of defences/ demountable defences was reported in this area by the EA.

8 January 2017 event (near miss event)

8.1 Lisa Porter reported on Lincolnshire Live on a near-miss event in January 2017. Titled Could it happen AGAIN? Boston fears floods after tidal surge warning\(^{16}\), the report commented on flood risk from significant storm surge events and anecdotal evidence of previous flooding in Boston:

8.1.1 Boston residents are bracing themselves as warnings are issued for a possible tidal surge across the east coast of the country. Yellow warnings are in place for Friday, January 13, for a combination of high tides, a surge, large waves and strong winds along the east coast.

8.1.2 Marjory Taylor said: "The flood risk appears to be low at the moment but then it seemed to be that way in 2013. The heavy rain mixed with the tidal surge caused the banks to burst, flooding the town. This is why people are preparing for the worst in case it happens again."

8.1.3 Another resident said he had pillow cases as hand to fill should the area begin to flood.

8.1.4 Joan Rochford added: "I think the town will always be on edge when this awful combination of weather is expected. It had a huge impact on the town when it happened in 2013."

8.2 The Boston Borough Council Twitter feed\(^{17}\) also featured updates on flooding conditions during the near-miss event:

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8.3 The Telegraph documented flood warning and flood risk information in a publication titled UK severe weather: Relief for east coast as tidal wave fails to wreak chaos:\(^{18}\):

8.3.1 Flood-threatened residents expressed relief on parts of Britain's east coast in the early hours of Saturday as a feared storm surge failed to deliver the chaos expected.

8.3.2 The Environment Agency's 17 severe flood warnings had been in place for coastal areas of Essex and Suffolk while dozens of flood warnings were imposed as the east coast braced itself for a storm surge.

Coastal communities in Lincolnshire, Norfolk, Suffolk and Essex were told they should be prepared for large waves and possible flooding.

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