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Note on Historic Tidal Floods in Bristol

Bristol was very much on the fringe of my research into sea floods on the Somerset coast and yet, at least 48 notable floods in the Bristol district were identified; one in the 15th C and 47 through the 17th to 20th centuries. These are itemised in the chronology attached. However, this cannot be considered as an exhaustive catalogue of inundations in Bristol.

There are at least 16 events, from 1483 to 1990, that can be described as significant tidal floods; specifically those of:

1483, 1606, 1636, 1687, 1703, 1796, 1846, 1869, 1883, 1896, 1899, 1903, 1910, 1936, 1954 and 1981.

More research is required to confirm the extent to which Bristol City itself was adversely affected by a further 20 or so events:

1794, 1798, 1810 (Dec.), 1838, 1859, 1870, 1891, 1900, 1923, 1924, 1953, 1957 (Feb.), 1957 (Sept.), 1962, 1974, 1976, 1977, 1978, 1984 and 1990.

The influence of the tide in causing flooding from the rivers Avon, Frome and Malago (tide-lock) could be further researched in some 12 events:

1738, 1739, 1808, 1809, 1810 (Nov.), 1821, 1823, 1836, 1882, 1889, 1914 and 1968.

The non-homogeneity of the data, and the apparent increase in frequency of events, may be due to one or a combination of reasons:

- The concentration of events in the last 200 years is likely a result of the greater availability of information, an increase of reporting in newspapers and due to Bristol's increased urbanisation.
- There have been different perceptions to flooding through the ages. Two records in the 17th C start '*another flood*' and suggest that flooding was considered a relatively common event and was not necessarily 'newsworthy'. This contrasts with some reports in the 19thC which, emphasising the impact of the event, have headlines such as '*the terrific gale*', '*tremendous seas*', '*a westerly hurricane ...*'.
- Other current affairs have taken precedence in the news on a number of occasions, during wars for example. Britain was at war with France from 1795 to 1815 and the newspapers of the time have very little other news. There are few newspaper reports of storms affecting the region between 1914 – 1918 and 1939 – 1945 although there was a succession of very deep depressions during both war periods (Lamb, 1990).
- Clusters of events, such as in 1869 - 1870, could be the result of storm-rich periods. Increased cyclone activity is now ascribed to fluctuations in the jet stream (Lamb, 1990; Met Office, 2015).

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Tidal Flooding in Bristol (historical records between 1483 and 1990)

Date of flood	Record of Tidal Inundation	Predicted HW tide level at Avonmouth (HAT: 8.1m ODN)
15 th October 1483 (OS)	In the evening <i>the greatest wind that ever was at Bristol ... caused a wonderful great flood. Great damage was done at Bristow in the merchants' houses and cellars. Ships at the mouth of the Avon were damaged and the Anthony and the Katherine were lost</i> (Seyer, 1823).	7.5m ODN at 18.44
20 th January 1606 (OS)	A major storm coinciding with a high spring tide caused widespread coastal flooding throughout the Bristol Channel and Severn Estuary (Smith, 2015). In Bristol, contemporary reports indicate the Back and the Key flooded and <i>it was so high in Reckliffe Temple and St Thomas Street as men's girdles</i> (Adams, 1910). The River Avon rose 5 feet [1.5m] at Treen Mills (now Bathurst Basin).	8.0m ODN at 08.54
4 th November 1636 (OS)	A south west wind blowing hard on a full spring tide caused a great inundation at Bristol. All the shops and the cellars on the Back and Key were flooded (Adams, 1910).	7.2m ODN at 20.06
22 nd March 1687 (OS)	There was widespread flooding on both sides of the Severn Estuary on this date. Records suggest the inundation was on a similar scale to those of 1607 and 1703. Seyer (1823) records from a 17thC source that on March 22 nd 1687 <i>a very high tide came up in Bristol, flooding and causing great damage. A boat came to the entrance of Baldwin Street and in the country [the floodwater] drowned many cattle.</i> Further archival research might reveal more information on the extent of flooding and associated weather.	7.8m ODN at both 07.37 and 20.00
27 th November 1703 (OS)	A severe storm caused widespread structural damage and both sea and land floods in the Bristol Channel and Severn Estuary region (Smith, 2015). One of Defoe's correspondents, Danial James, wrote from Bristol: <i>on Saturday 27th November, between 1 and 2am, arose a most prestigious storm of wind, which continued with little intermission for 6hrs. There was great damage done by the wind but the greatest damage done to the city was the result of the violent overflowing of the tide. Forced by the wind, the tide flowed to an extraordinary height; it broke in with great fury over the Marsh Country, forcing down the banks or sea walls, drowning abundant sheep and other cattle. Many persons lost their lives</i> (Defoe, 1704). The parish records of St Stephen's, adjacent to the key on the River Frome in Bristol, state that the water attained a depth of 6 feet on the floor of the church (Stone, 1909). The church sustained considerable damage from the wind as three of the four pinnacles were blown off (Seyer, 1821).	6.9m ODN at 06.34

10th January 1738	At Bristol, a prodigious flood occurred on the Avon and Frome owing to protracted rains. A high tide aided the inundation and many low-lying streets were submerged (Latimer, 1893). On the previous day, a violent storm and inundation on the South Gloucestershire coast was recorded (Fosbroke, 1807), confirming the likelihood that a storm surge contributed to flooding in Bristol. Further research might identify the extent of the flooding.	7.3m ODN at 07.54
January 1739	Another great flood took place in Bristol in January 1739 (Latimer, 1893).	
October 1794	On 29 th October, a spring tide and a high westerly wind caused Bristol to be visited by the highest flood in memory of man (Nicholls & Taylor, 1881). This date is questionable, as spring HWs were in the week before. Also, earlier in the month, Cork in southern Ireland had experienced a sea-flood from the 'highest tide known for years' (London Packet, 20 th October 1794). The Cardiff area suffered flooding at the end of the month (The Sun, 5 th December 1794).	
25th January 1796	At Bristol, on 25 th January, surge tides both in the morning and evening caused flooding in most of the lower parts of the city. So high a flood had not been seen since 1703 (The Times, 29 th January 1796). The predicted tides were average springs, 13.6m ACD at Avonmouth. The coincident surge must have exceeded 1.0m to cause flooding. This was not an isolated event; storms were reported all along the south coast, in London and in the North Sea in the days following (The Times, 27 th and 28 th January 1796).	7.1m ODN at both 07.44 and 20.12
1798	Two major storms, in September and November 1798, accompanied by high tides, resulted in sea-flooding in Somerset (Williams 1970; WWA, 1979). Further research may reveal whether Bristol was affected.	
1808	Floods in Bristol (The Times, 18 th April 1808)	
1809	Severe floods in Bath and Bristol (Horton, 1995)	
10th November 1810	The Bristol Journal of Saturday November 17 th 1810, reports that on Friday night, and the whole of Saturday 10 th November, there was one of the heaviest gales of wind, accompanied by incessant rain. In Bristol, floods several feet deep resulted at Baptist Mills, in the streets in St Pauls, in Broad Weir and Merchant Street.	7.1m ODN at 18.32
25th December 1810	Severe gales affected the whole of Great Britain at the end of December 1810. Tempestuous weather in the Severn Estuary caused flooding in Gloucestershire and storm-surge flooding was reported on the Welsh and Somerset coasts on Tuesday 25 th December. <i>The waters of the Frome overflowed its banks; and the valley between Bristol and Stapleton was one continued sheet of water.</i> (The Times, 1 st January 1811). If the flooding at Bristol was due to a storm tide, the surge possibly exceeded 1.5m.	6.6m ODN at 18.28
1821	Great gales and floods occurred in December. Levels in the River Avon at Bath rose <i>a full 12 feet above normal</i> and hundreds of families suffered hardship as a result of the floods (Horton, 1995). Further research might reveal if Bristol was adversely affected.	
1823	Continued rain through October, November and December caused the River Avon to rise to unprecedented levels. The city of Bath in particular suffered from remarkable flooding (Horton, 1995). Further research might reveal if Bristol was adversely affected.	

29th November 1836	The Bristol Mercury, on Saturday 3 rd December 1836, reports that a violent storm occurred on the evening of Monday 28 th November and into the morning of Tuesday 29 th November 1836. On this occasion, the tide may not have contributed to flooding. However, two hours of torrential rain on the Tuesday morning resulted in flooding of the low lying areas of Bristol. At 10am, the rain stopped but at that time, the wind came on from the west and south-west, causing structural damage in the city and several severe injuries to people.	4.4m ODN at 10.06
29th October 1838	A damaging storm affected the whole of the southern Britain from 28 th to 29 th October. The windstorm hit Somerset on the night of 28 th /29 th October, causing losses on land and at sea. On the tidal River Avon at Pill, a surge of ten feet (3m) caused vessels to be stranded (Bristol Mercury, 3 rd November 1838). The predicted high water at Avonmouth was just 10.5m ACD and the vessels could not be floated off until the spring tide 5 days later. In parts of Somerset, on 2 nd November, a storm coincided with this high spring tide to cause coastal flooding.	4.0m ODN at 03.31
29th January 1846	<p>The Bristol Mercury newspaper of Saturday 31st January 1846, reported extraordinary high tides, floods and destruction of property as a result of remarkable high tides in the Bristol Channel and Severn Estuary. The coastal lowlands on both sides of the Severn were flooded with livestock and property lost.</p> <p>Portishead suffered one of the greatest floods ever seen on Thursday morning. The inundation was extensive and the water in some houses stood several feet high.</p> <p>At Bristol, the tide rose rapidly, meeting the fresh in the Frome and Avon. The ‘fresh’ means the rivers were swollen from the rains. George Muston’s meteorological register, published in the Bristol Mercury of 7th February 1846, records rain throughout the week preceding the flood.</p> <p>At the Cumberland Basin, the tide rose to an unprecedented height, floating a boat over the top of the dock-gate, and at Bathurst Basin, the tide rose to a great height, surmounting the gate.</p>	8.1m ODN at 08.31
25th October 1859	Two storms in October and November 1859 resulted in flooding on the Somerset coast. The first of these on 25 th /26 th October 1859 coincided with a spring tide in the Severn Estuary. This storm, the Royal Charter Storm, is so called because of the loss of the SS Royal Charter, together with the lives of 500 passengers and crew, off the coast of Anglesey (Lamb, 1991). The Western Counties Herald and Bridgwater Mercury of Wednesday October 26 th 1859 reported that, in total, more than 600 vessels were lost or damaged in the storm. The tide at Bridgwater rose 5ft higher than the predicted level. Further research might reveal if Bristol was adversely affected by the surge tide.	7.3m ODN at 18.36
31st January 1869	<p>The wreck register for 1869 records 2114 shipwrecks and 933 lives lost in British waters (Bristol Mercury, 29th October 1870). At least six events affected the Bristol Channel and Severn Estuary in 1869. The first of these, on Saturday 30th, Sunday 31st Jan and Monday 1st February, caused widespread inundation as heavy gales of wind raised the tides to unprecedented levels (Western Daily Press, 2nd February 1869).</p> <p>A storm-surge of 1m was recorded on the River Avon at Bristol on Sunday morning. Coinciding with a high spring tide, the tide overflowed and flooded many low-lying parts of the city (Bristol Mercury, 6th February 1869).</p>	7.7m ODN at 09.34

24th October 1870	A severe gale coinciding with a high spring tide caused storm-surge flooding on the Somerset coast. Further research might reveal if Bristol was adversely affected by the surge tide.	7.6m ODN at 18.58
24th October 1882	In Bristol, Baptist Mills, Stapleton Road, Bedminster and the St Agnes district flooded on 23 rd October 1882. The following day, the Frome continued to rise, flooding Newfoundland Road, Paul Street and Portland Square to depths of several feet. Claims against the Council in Bristol for negligence amounted to £44,890, although it seems the claims did not proceed (Horton, 1995). Photographs of Bristol in the floods of 1882 show Merchant Street and Broadmead inundated (Harrison & Brooke, 1998). The Bristol Mercury of Wednesday 25 th October 1882 reported that the tide did play a role in this flooding. Further research of predicted tide levels could indicate to what extent.	
17th October 1883	A severe gale on the evening of 17 th October caused widespread tidal inundation on the Bristol Channel and Severn Estuary coasts. At Avonmouth, the coincident surge of 0.9m took the tide to the highest ever recorded (WWA, 1982). The Port and Pier Railway terminus at Avonmouth was badly damaged and there was severe flooding at Pill, St Georges, Portbury and at Portishead. At Bristol, the surge at the Cumberland Basin was estimated at more than 1m and much of Hotwells and Ashton were flooded. The Bristol Mercury of 19 th October 1883 reported that at the Rownham Hotel, <i>a man rowed a boat into the bar and was served with a glass of ale</i> . The New Cut flooded and the dock gates at Bathurst Basin were overflowed and adjacent properties flooded. More detailed information on the weather, tide levels and extent of flooding is available.	8.0m ODN at 19.54
9th March 1889	48 hours of rain accompanying a rapid thaw, saw widespread flooding from Devon to the Midlands. Bristol experienced the worst floods for 200 years (Horton, 1995; Winstone, 1987). Further research of predicted tide levels could indicate whether the tide played a role.	
October 1891	The high tide caused flooding at Bristol (Bristol Mercury, 9 th October 1896)	
7th October 1896	A strong gale affected the North of France, the Channel, England, Wales and Ireland, causing shipping losses, considerable structural damage and flooding (Bristol Mercury, 8 th October 1896). Three consecutive high tides on the Avon from the evening of Wednesday 7 th to the evening of Thursday 8 th October 1896 caused widespread inundation. At high water there was extensive flooding at Pill and between Avonmouth and Portishead. Farmers in the area had anticipated the unusual rise on Wednesday, moving stock to higher ground. Fields were flooded to feet deep but no loss of animals was reported. However, properties were damaged in Pill and Shirehampton. At Bristol, the strong SW wind and an excessive amount of flood water after rains caused a rise at Cumberland Basin of 39 feet [12m] when the tide flowed over the top of the outer lock. Clifton Park Station was flooded and many houses were inundated at Ashton, St Phillips Marsh, Bedminster and other districts (Latimer, 1902; Stone, 1909). On 9 th October 1896 the Bristol Mercury detailed the flooding experienced in areas of Bristol,	7.8m ODN at 19.25

	where houses were inundated to depths of 3 or 4 feet. The 3 high tides in succession did much damage, more than that of 5 yrs before [probably 1891] although not as high as that of 13 yrs previously [1883].	
12th February 1899	On 12 th February the Avon rose to its highest in 40 years on account of continual rain and the high spring tide. Many of the usual places in Bristol were flooded to several feet (Horton, 1995).	8.1m ODN at 08.33
December 1900	A severe gale caused great loss throughout the British Isles and France on Friday 28 th December. The gale was felt severely in the Bristol Channel (The Times, 29 th December 1900) and on the Somerset coast, the westerly gale wrought havoc; boats were wrecked and harbours damaged (The Times, 31 st December 1900). No specific floods are recorded in conjunction with this storm, although Horton (1995) does suggest there was flooding in Bristol at the end of December 1900. Further research might reveal the extent to which Bristol was affected.	
10th September 1903	A severe gale caused widespread damage across Northern France, Southern Ireland, Wales and England on 10 th September 1903. The storm hit the Bristol Channel and Severn Estuary at the time of the evening HW causing considerable structural damage. The coincident surge caused widespread sea-flooding. At Bristol, the gale caused damage to property across the city. St Philips Marsh was inundated and a large number of houses were flooded (The Times, 12 th September 1903). Further research of Bristol newspapers would likely give more detail of this event.	6.1m ODN at 21.14
16th December 1910	A severe gale was caused by a deep cyclonic system crossing the British Isles on 16 th December 1910. Although of relatively short duration, the gale caused widespread damage in the west and south of Britain. There had been widespread flooding in England following previous rains and the further heavy rains and rough weather associated with gale of 16 th December exacerbated the situation. At Avonmouth, the docks were badly damaged in the storm. The Times newspaper of 19 th December reported that in Bristol, the low lying streets are under water, and houses flooded to a depth of many inches. Further research of local newspapers will most likely identify the extent, and possibly depth, of flooding in Bristol.	6.9m ODN at 19.04
1914	After a series of depressions, on 16 th March a gale of unusual severity affected the Bristol Channel on the morning of 16 th March (The Times, 17 th March 1914). Further research might reveal whether this was the same event that caused flooding in Bristol, illustrated in contemporary newspaper photographs (Harrison & Brooke, 1998)	
10th October 1923	A low pressure system affected the western coasts of Britain on 10 th October (Zong & Tooley, 2003). The westerly gale coincided with a spring high tide, to raise the tide at Severn Beach to its highest in 15 years (The Times, 12 th October 1923). Flooding was also experienced on the Somerset coast (Western Daily Press, 11 th October 1923). Further research may reveal whether Bristol was affected by this event	
26th December 1924	An unusually deep depression with a central pressure of 925mb lay off Iceland at the end of December 1924. A terrific gale swept the whole of Britain on Friday 26 th December and through Saturday, causing widespread damage, shipwrecks and loss of life. The SW gale was accompanied by torrential rain and floods (Bridgwater Mercury, 31 st December 1924). The gale coincided with high tides on the Somerset coast to cause flooding. The heavy rain and high tides also caused flooding in Gloucestershire.	

	Further research may reveal the extent to which Bristol was affected by this event	
9th January 1936	<p>A very intense depression caused severe gales across Britain. A surge in the outer Severn Estuary of more than 2m coincided with an average spring HW to cause extreme levels and flooding.</p> <p>In Bristol, the water rose over the quay walls and the lock gates at the Cumberland Basin and poured into the harbour, raising it 2ft above the normal level. Tramway and omnibus traffic had to be suspended at Hotwells. There was flooding in the lower-lying parts of Bristol beside the Avon. Houses in the Albert Road district of St Philips were inundated to the tops of the kitchen stoves. At the Bristol Dogs' Home, 130 dogs were saved from drowning just in time by a member of staff, who, wearing a bathing costume, waded waist deep in water (The Times, 11th January 1936).</p> <p>The Bristol Evening Post newspaper of Friday 10th January 1936, explained that the storm-tide at Bristol was the highest since 1896. The tide level was over 8ft [2.4m] higher than predicted. At the height of the flood in Bristol, there was an uninterrupted stretch of water from Merchants Road to Avon Crescent.</p>	7.2m ODN at 19.50
September 1953	<p>High tides in excess of 14.5m ACD inundated Pill on the River Avon on 22nd and 23rd September and caused the worst flooding in 20 years (The Times, 25th September 1953). In Somerset, the Parrett overflowed on 24th September, flooding Bridgwater and District (Bridgwater Mercury, 29th September 1953).</p> <p>Further research may reveal whether Bristol was also affected by these high tides.</p>	
14th September 1954	<p>High tides in the River Avon caused the worst floods that Ashton Gate in Bristol had experienced for many years (The Times, 15th September 1954).</p>	
16th February 1957	<p>In Somerset, Bridgwater and surrounding areas experienced severe flooding on 16th February when the River Parrett rose to its highest in more than 20 years and overflowed its banks (The Times, 18th February 1957). Combwich had its worst flood since 1924 (Bridgwater Mercury, 19th February 1957). The high tide also caused flooding in Burnham and Highbridge. Despite a calm sea, the high tides overflowed the sea walls and caused damage at Ilfracombe. Highest astronomical tides were predicted (14.6m ACD at Avonmouth).</p> <p>Further research may reveal whether Bristol was also affected by this high tide event.</p>	
24th September 1957	<p>A depression over the Irish Sea, with central pressure below 980mb, brought heavy seas to the Bristol Channel and Severn Estuary (The Times, 25th September 1957). There was flooding at Barnstaple, Bideford and Ilfracombe as the storm-surge coincided with a high spring tide, predicted to be 14.6m ACD at Avonmouth. Further research may reveal whether Bristol was affected by this high tide event.</p>	
11th January 1962	<p>Strong gale force 9 winds, gusting up to 90mph, were recorded in the Bristol Channel and Severn Estuary on 11th January (The Times, 12th January 1962; Horton, 1995). The sea wall was breached at Weston-super-Mare (EA, 2009). At 7am, a surge peak of 2.4m, the 4th highest ever recorded at Avonmouth, occurred on the rising tide (Lennon, 1963). At 10.30, at HW, the coincident surge was</p>	

	<p>lower but still produced a notable high tide exceeding 14m ACD at Avonmouth. Damage occurred to the lock gates at Avonmouth Docks. It was considered the worst gale since 1936 at Severn Beach where there was severe damage. Huge seas wrecked the sea wall and flooded properties to a depth of 3ft (Horton, 1995).</p> <p>Further research may reveal whether Bristol was affected by this event.</p>	
July 1968	<p>There were great floods in Somerset, causing severe damage and loss of life, following a prolonged thunderstorm and torrential rain on 10th July. More than 5 inches of rain fell in less than 24 hours (Staples, 1988). Many areas of Bristol and the surrounding district were inundated but there is little evidence that the tide played any role in the flooding.</p>	
9th February 1974	<p>In early February, storms crossed the region at the time of high spring tides. A surge coinciding with HW on 9th February, caused tidal inundation in the Severn Estuary. Gloucestershire saw some of the worst tidal flooding for many years (The Times, 11th February 1974).</p> <p>The storm tide was listed as one of the ten highest tides ever recorded at Avonmouth by NTSLF to 2015.</p> <p>The Bristol Evening Post of 9th February reported that the Avon (already swollen after 72 hours of continuous rain) overflowed at Bristol as levels reached their highest since 1962.</p> <p>Further research of local newspapers may identify the extent, and possibly depth, of flooding in Bristol.</p>	8.0m ODN at 08.49
2nd January 1976	<p>A severe gale affected Britain on the evening of 2nd January causing widespread damage and disruption (Bridgwater Mercury, 6th January 1976; Met Office 2010). Coastal flooding ensued on the Somerset coast as the spring tides were raised by a coincident surge, recorded as 0.8m at Clevedon and 2.0m at Severn Beach. At Severn Beach, 200 homes were flooded, some up to 5ft deep (Horton, 1995).</p> <p>Further research may reveal whether Bristol was affected by this event.</p>	
11th November 1977	<p>A vigorous secondary depression brought damaging westerly winds to the Somerset coast at the time of high spring tides. Localised flooding was recorded on the Somerset coast.</p> <p>Further research may reveal whether Bristol was affected by this event.</p>	
9th February 1978	<p>In Somerset, the River Parrett overflowed on a high spring tide on 9th February (Bridgwater Mercury, 14th February 1978). The previous day, thousands of acres of Gloucestershire were flooded from the high tide in the Severn (The Times, 9th February 1978).</p> <p>Further research may reveal whether Bristol was affected by these high tides.</p>	
13th December 1981	<p>An intense secondary depression crossing South Wales on the evening of 13th December developed a storm surge that coincided with high water in the Bristol Channel and Severn Estuary. Widespread flooding ensued on the Somerset and Gloucestershire coasts.</p> <p>The Avonmouth tidal gauge failed at the peak of the tide, recording 15.4m ACD at 21.00 and indicating a surge of 1.6 - 1.8m. Williams et al (2012) consider this to be the highest water level recorded in the Bristol Channel in a century.</p>	7.3m ODN at 20.45

	Pill and Sea Mills on the lower River Avon were badly flooded. In Bristol, the Portway and Cumberland Road were submerged. The City docks overflowed, flooding Cattle Market Road and Albert Road (Western Daily Press, 14 th December 1981). Further research of local newspapers may identify the full extent, and possibly depth, of flooding in Bristol.	
23rd November 1984	Violent storms and high tides swept the Bristol Channel coast on 23 rd November (Burnham & Highbridge Gazette, 27 th November 1984). A surge of 1.1m coincided with a high spring tide on the Somerset coast to cause damage to the sea defences and localized flooding. Further research may reveal whether Bristol was affected by this high tide.	
26th February 1990	An intense secondary depression crossed England and Wales on the morning of 26 th February. Strong westerly winds had been blowing for over 12 hours. A storm surge coincided with HW to produce a tide of 15.0m ACD at Avonmouth. The extreme tide led to tidal inundation at many points along the Somerset coast (NRA, 1990). Pill flooded to a depth of 3ft and a powerboat is reported as having sped down the High Street (Western Daily Press, 27 th February 1990). Further research may reveal whether Bristol City was affected by this high tide.	7.0m ODN at 07.54

Avonmouth Tidal Predictions come from the United Kingdom Hydrographic Office (UKHO) Admiralty Easy Tide Service at <http://www.ukho.gov.uk/Easytide/easytide/RecentPredictions.aspx>

Tidal differences on Avonmouth (from Reed's Nautical Almanac, 1989)

River Avon	HW time differences		MHWS height differences (m ACD)
Port of Bristol (Avonmouth)	0200 & 1400	0800 & 2000	13.2
Shirehampton	0000	0000	-0.7
Sea Mills	+0005	+0005	-1.4
Cumberland Basin	+0010	+0010	-2.9

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