

**Data set title:**

An improved database of coastal flooding in the United Kingdom from 1915 to 2016.

**Data set creator(s) and institute(s):**

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**Data set abstract:**

Coastal flooding caused by extreme sea levels can produce devastating and wide-ranging consequences. The ‘SurgeWatch’ v1.0 database systematically documents and assesses the consequences of historical coastal flood events around the UK (Haigh et al., 2015). The original database was inevitably biased due to the inconsistent spatial and temporal coverage of sea-level observations utilised. Therefore, we present an improved version integrating a variety of ‘soft’ data such as journal papers, newspapers, weather reports, and social media. SurgeWatch2.0 identifies 329 coastal flooding events from 1915 to 2016, a more than fivefold increase compared to the 59 events in v1.0. Moreover, each flood event is now ranked using a multi-level categorisation based on inundation, transport disruption, costs, and fatalities: from 1 (Nuisance) to 6 (Disaster). For the 53 most severe events ranked Category 3 and above, an accompanying event description based upon the Source-Pathway-Receptor-Consequence framework was produced. Thus, SurgeWatch v2.0 provides the most comprehensive and coherent historical record of UK coastal flooding. It is designed to be a resource for research, planning and management and education. Haigh et al. (2017) provides more detail. Collation of the database and the development of the website was funded through a Natural Environment Research Council (NERC) impact acceleration grant. The database contributes to the objectives of UK Engineering and Physical Sciences Research Council (EPSRC) consortium project FLOOD Memory (EP/K013513/1).

**Data set format:**

The database contains 58 files: 1 XLSX file, 55 PDF files and 2 CSV file. The first file is a spreadsheet (XLSX) containing the list of all 329 coastal flood events in the database categorised according to the severity scale that we devised. The second and third files are PDF documents containing the short commentaries for all Category 1 and 2 events. There are an additional 53 PDF files containing the longer event commentaries for events ranked Category 3 and higher. A final two CSV files contains the water levels and digitised storm tracks for the 53 Category 3 and higher events. Each of these files is self-describing and is accompanied by extensive metadata.

Parameter	Description	Unit
<b>water_levels.csv:</b> This file contains peak water levels for each category 3 event and higher.		
Tide gauge site	Name of tide gauge site	Free text
Date and time	Date and time of measurement to GMT. Note the tide gauge is accurate to one minute.	dd/mm/yyyy hh:mm
Offset return period	Estimated return period of the water level after it was offset by the observed linear rate of mean sea level rise, relative to the base year 2008. These were estimated by linearly interpolating the latest Environment Agencies water level exceedance probabilities (McMillan et al., 2011; Batsone et al. 2011) at each site.	years
Water level	Water level measured by tide gauge. Tide gauges are accurate to 1 centimetre.	metres Admiralty Chart Datum
Astronomical tide	The corresponding tidal component of water levels (i.e. generated by astronomical forces, often called predicted tide) at the time of maximum water level.	metres
Skew Surge	The difference between the maximum observed water level and the maximum predicted tidal level regardless of their timing during the tidal cycle.	metres
<b>storm_tracks.csv:</b> This file contains storm tracks for each category 3 event and higher.		
Date and time	Six-hourly date and time of measurement to GMT.	dd/mm/yyyy hh:mm

Longitude	The location of the minimum mean sea level pressure of the storm to 5 decimal places. Note: the 20 <sup>th</sup> Century reanalysis grid as a spatial resolution of 2 degrees.	degrees
Latitude	The location of the minimum mean sea level pressure of the storm to 5 decimal places. Note: the 20 <sup>th</sup> Century reanalysis grid as a spatial resolution of 2 degrees.	degrees
Atmospheric pressure	The minimum atmospheric pressure at sea level of the storm at that time.	millibar
EVENT ID	The event ranking.	number

### **Reference:**

- Haigh, I.D., Wadey, M.P., Gallop, S.L., Loehr, H., Nicholls, R.J., Horsburgh, K., Brown, J.M., Bradshaw, E., 2015. A user-friendly database of coastal flooding in the United Kingdom from 1915–2014. *Scientific Data* 2, . 150021
- Haigh, I.D., Ozsoy, O., Wadey, M.P., Nicholls, R.J., Gallop, G.L., Wahl, T., Brown, J.M., 2017. An improved database of coastal flooding in the United Kingdom from 1915 to 2016. In review *Scientific Data*.