TECHNICAL NOTE

JBA Project Code	2023s0597
Contract	Adur and Worthing SFRA
Client	Adur District Council and Worthing Borough Council
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Subject	Adur and Worthing Tidal Risk Zones

1 Introduction

As part of the Adur and Worthing Level 1 Strategic Flood Risk Assessment (SFRA), Tidal Drainage Risk Zones and Groundwater Risk Zones were derived to understand how increases in tidal levels associated with climate change may impact groundwater and surface water flood risk within the Local Plan areas.

1.1 Data

To enable both the Tidal Drainage Risk Zone Assessment and the Tidal Groundwater Risk Zone Assessment the following datasets were used:

- Present day 1% Annual Exceedance Probability (AEP) extreme tidal level
- Environment Agency climate change sea level uplift allowance for South East England
- Environment Agency 1m LIDAR Composite Digital Terrain Model (DTM)

In addition, for the Tidal Drainage Risk Zone assessment the following datasets were also utilised:

- The Risk of Flooding from Surface Water (RoFSW)
    - 1% AEP extent
    - 1% AEP +45% climate change uplift extent

For the Tidal Groundwater Risk Zone assessment, the following was used:

- JBA 5m Groundwater flood risk mapping dataset (which provides an indication of the 100-year groundwater flood levels)
- The British Geological Society 50k bedrock mapping

1.2 Estimation of tidal levels

A present day 1% AEP extreme tidal level of 4.1m AOD was derived from the Coastal Extremes Study based on an average level along the Adur and Worthing coastline. Table 1-1 shows the model points used to derive the average extreme tidal level.

Table 1-1: Coastal Extremes Study model nodes

Chainage	Level (m AOD)	Easting	Northing
4564	3.97	509330	99495
4562	4.00	511301	99775
4560	4.03	513277	99975
4558	4.06	515243	100336
4556	4.09	517137	100973
4554	4.12	518995	101675
4552	4.15	520916	102217
4550	4.17	522885	102422

4548	4.19	524855	102652

To obtain a future extreme tidal level the present day 1% AEP was uplifted by 1.10m to 5.20m AOD. This is in line with the Environment Agency uplift allowances for sea level rise by 2125 in the South East of England using the Upper End scenario. The cumulative sea level rise provided by the Environment Agency is based on the rise between 2000 and 2125, the average coastal extremes study was conducted in 2017, therefore the uplift has been adjusted to account for this.

1.3 Analysis

Analysis of the risk zones was carried out using QGIS and scores have been calculated by comparing the RoFSW datasets for the Drainage Risk Zones and the groundwater dataset for the Groundwater Risk Zones to the present day and future tidal levels using the criteria detailed below.

For the Groundwater Risk Zones, only areas which are within permeable geological units connected to the coast have been considered with the analysis as these are the only areas which are expected to be at risk of tidally influenced groundwater flooding.

The resulting scores were then applied to a 25m grid across Adur and Worthing. The risk value in each grid square was calculated as the mean value based on the area of each risk zone with the grid square.

1.4 Tidal Drainage Risk Zone - scoring criteria

Table 1-2 and Figure 1-1 detail the criteria used to create score for the Drainage Risk Zones.

Table 1-2: Criteria used to score present day and future tidally influence surface water flood risk.

Score	Criteria use to score and present future risk
SW0	Above the future tidal level
SW1	Not at risk of SW flooding and above the current tidal level but below the future tidal level
SW2	Not at risk of SW flooding but below the present-day tidal level OR at risk of SW flooding from climate change only and above the current day tidal level but below future tidal level
SW3	At risk of SW flooding from climate change only and below the present-day tidal level OR At risk of SW flooding without climate change and above current day tidal level but below future tidal level
SW4	At risk of SW flooding without climate change and below present-day tidal level

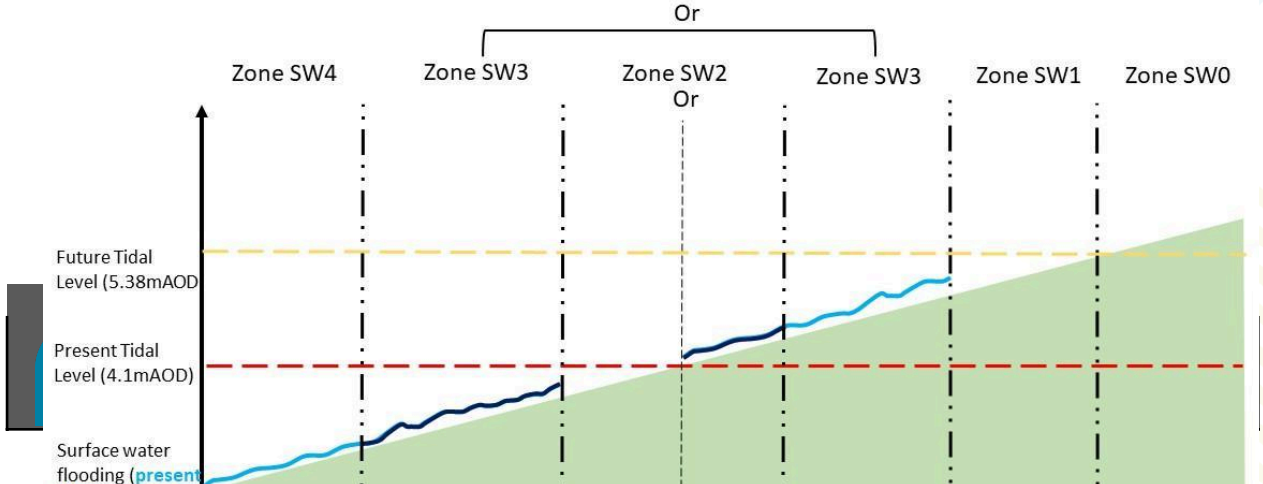

Figure 1-1: Graphical representation of scoring criteria for Drainage Risk Zones

1.5 Tidal Groundwater Risk Zone - scoring criteria

Table 1-3 details the criteria used to create score for the Groundwater Risk Zones.

Table 1-3: Criteria used to score present day and future tidally influenced groundwater flood risk.

Score	Criteria used to score and present and future risk
GW0	Above the future tidal level
GW1	Groundwater level more than 0.5m below the surface and region is above the current tidal level but below the future tidal level
GW2	Groundwater level more than 0.5m below the surface and region is below the present-day tidal level OR groundwater level between 0.025m and 0.5m below the surface and region is above the current tidal level but below the future tidal level
GW3	Groundwater level between 0.025m and 0.5m below the surface and region is below the present-day tidal level OR Groundwater level within 0.025m of the surface and region is above the current tidal level but below the future tidal level
GW4	Groundwater level within 0.025m of the surface and region is below the present day tidal level