

SECOND CYCLE PRELIMINARY FLOOD RISK ASSESSMENT FOR LINCOLNSHIRE

Lincolnshire County Council carried out the first Preliminary Flood Risk Assessment (PFRA) in 2011.

The PFRA and flood risk areas (FRAs) for Lincolnshire County Council were reviewed during 2017 (the Second Cycle), using all relevant current flood risk data and information.

There were no significant changes required to the 2011 PFRA, that is, no new FRAs were identified.

Methods used to identify FRAs for the Second Cycle

Two methods were used to identify areas of potentially significant risk. Both methods used national information from the current (2016) Risk of Flooding from Surface Water (RoFSW) map - previously known as the updated Flood Map for Surface Water (uFMfSW) - and a rainfall event with a 1% chance of occurring in any year.

A property is considered at risk of flooding if more than 50% of its perimeter is flooded by the 1% annual probability rainfall with a depth of greater than zero (see Figure 1 below)

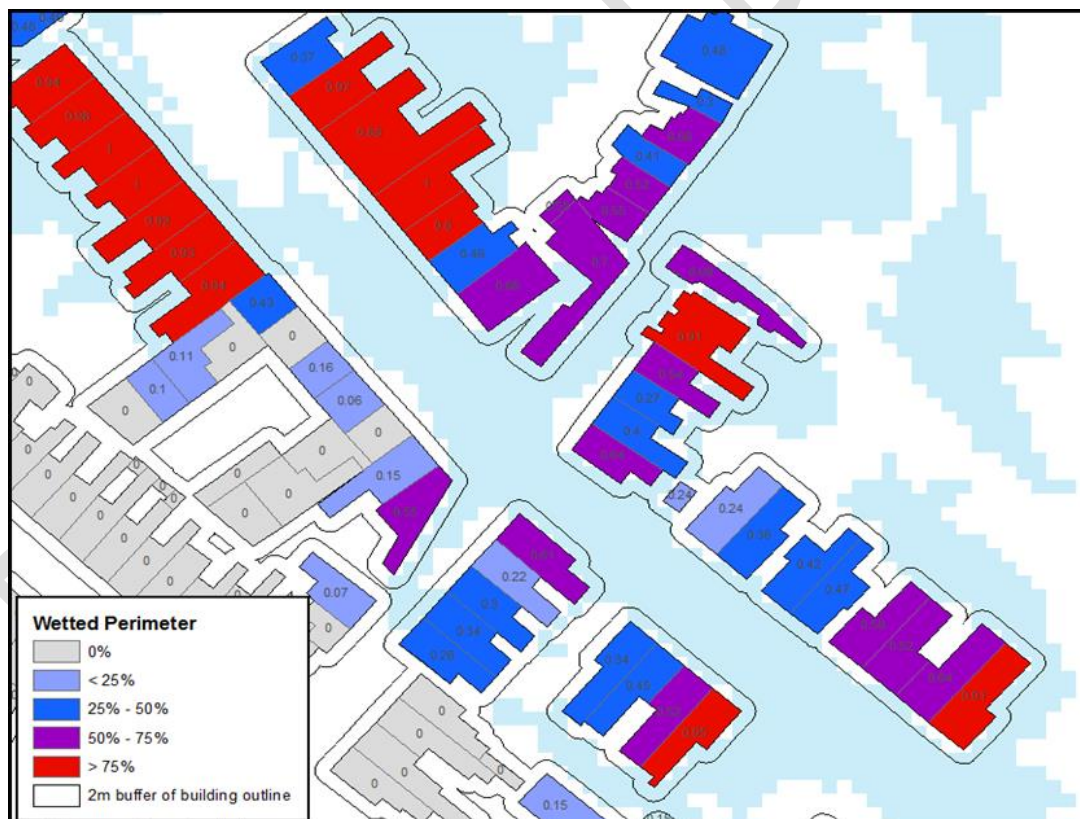


Figure 1. Properties considered at risk of flooding due to their wetted perimeter

Method 1 - cluster analysis for concentrations of people/property at risk

In this method, 1km grid squares of places where surface water flood risk is an issue were identified as a "blue square" if at least one of the flood risk indicators listed below is above the threshold.

In some areas these blue squares might be densely packed together representing a concentration of high consequences from surface water flooding and providing a way of identifying areas where local flood risk could be significant. A so-called cluster is formed where, within a 3x3 km square grid, at least 5 of the 1km squares meet the criteria for blue squares; such clusters identify indicative FRAs.

The flood risk indicators used in the identification of blue squares and subsequently clusters and indicative FRAs are summarised in Table 1 below. These are similar to those used to develop indicative FRAs in 2011, but using a rainfall event with a 1% chance of occurring in any year rather than 0.5% chance as in 2011. This is because current surface water risk products do not include the assessment of a 0.5% chance rainfall event.

Table 1: Flood Risk Indicators and criteria (Cluster Method)

Method for determining indicative Flood Risk Areas	Definition	Indicator	Criteria
Cluster method	<p>A cluster is formed where, within a 3x3 km square grid, at least 5 of the 1km squares meet the criteria for one or more of the indicators.</p> <p>Where multiple overlapping grids meet the requirement, these are unified to form a larger cluster.</p> <p>All of the clusters (both small and large) have been identified as indicative flood risk areas.</p>	Number of people at risk of surface water flooding	<p>200 people or more per 1km grid square</p> <p>Number of people taken as 2.34 times the number of residential properties at risk.</p>
		Number of key services at risk of surface water risk e.g. utilities, emergency services, hospitals, schools	More than one per 1km grid square
		Number of non-residential properties at risk	20 or more per 1km grid square

Method 2 - Communities at risk (C@R)

Method 1 identifies locations where the density of flood risk is highest across the country. There are other locations where the total flood risk is high but not as concentrated as those areas identified in method 1. So, to complement method 1, information was used from the Environment Agency's (EA) C@R work.

For C@R the EA analysed the surface water flood risk for communities according to [Office for National Statistics built-up areas \(BUAs\) and built-up areas sub-divisions \(BUASDs\)](#). Built-up areas (BUAs) are characteristic of settlements including villages, towns or cities. In 2011 across England and Wales 95 per cent of the usually resident population lived in BUAs. They include areas of built-up land with a minimum of 20 hectares (200,000m²). Any areas with less than 200 metres between them are linked to become a single BUA, with BUASDs identified.

Where available, BUASDs were used to provide greater granularity of communities in large urban areas. Where this approach identifies 3000 or more reportable properties at risk of surface water flooding, the BUA/BUASD forms an indicative FRA. As with method 1, this is for a rainfall event with a 1% chance of occurring in any year (refer to Table 2).

The National Receptor Database (NRD2014) property point dataset with the uFMfSW Property Point v3 attributes was used to classify a property as 'at risk' of flooding from surface water. 'At risk' properties were counted by BUASD boundary (to exclude non-reportable property points e.g. telephone boxes, advertising hoardings).

Table 2: Flood Risk Indicators and criteria (Communities at Risk method)

Method for determining indicative Flood Risk Areas	Definition	Indicator	Criteria
Communities at risk method	Community areas, as defined by the Office for National Statistics built-up areas (BUAs) and built-up areas sub-divisions (BUASD), where there is a large number of properties at risk.	Number of reportable properties (residential and non-residential) properties at risk	3000 or more reportable properties (residential and non-residential) within a BUA/BUASD.

Combining Method 1 and Method 2 and identifying indicative FRAs

In some locations, clusters of blue squares from Method 1 and BUA/BUASDs from Method 2 overlap. Where this is the case, the indicative FRA is the total extent of the two areas combined.