

# Local flood risk management in Kent

Session 3, Paper 1.

Max Tant, Flood Risk Manager, Kent County Council; [max.tant@kent.gov.uk](mailto:max.tant@kent.gov.uk); 01622 221961

## Introduction

Kent County Council (KCC) is a large upper tier authority serving a population of approximately 1.4 million people, the largest population of any Lead local Flood Authority (LLFA). There are twelve lower tier authorities in Kent. There are six internal drainage boards (IDBs) in Kent, two administered by the EA and four independent IDBs.

Kent has a varied geography with the chalk hills of the North Downs; clay and sandstone hills of the High Weald; the wealden clay vales of the Low Weald; london clay along the north coast and Thames Estuary; and significant tidal flats and alluvium along the 326 miles of coastline, one of the longest in England. Figure 1 shows the topography of Kent.

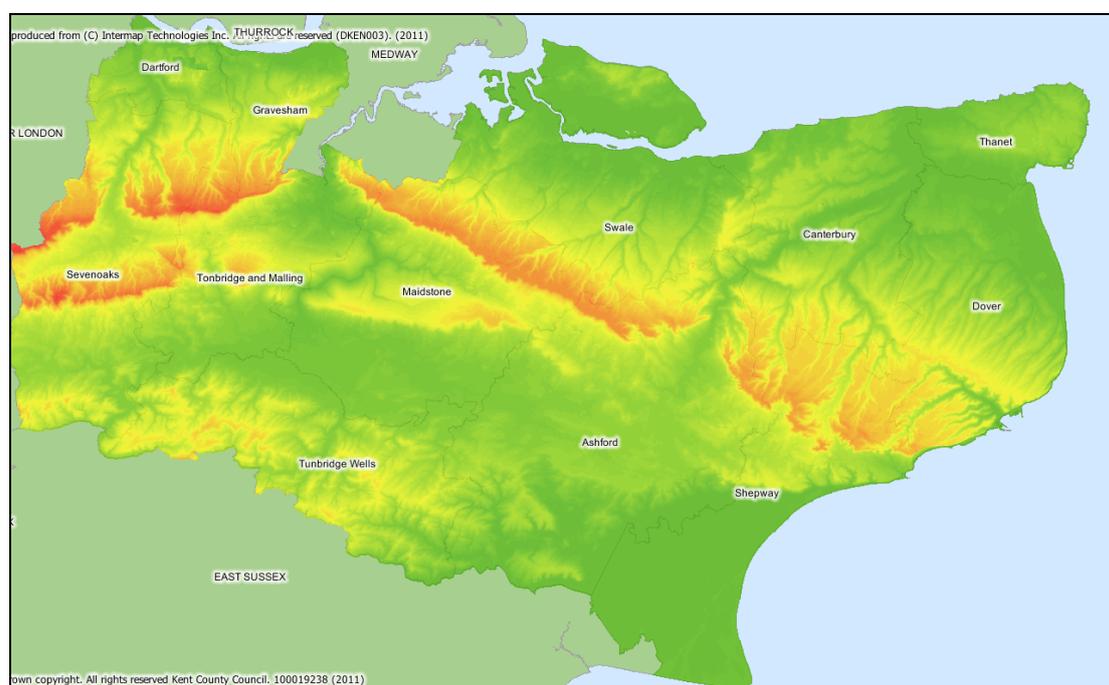


Figure 1 Topography of Kent

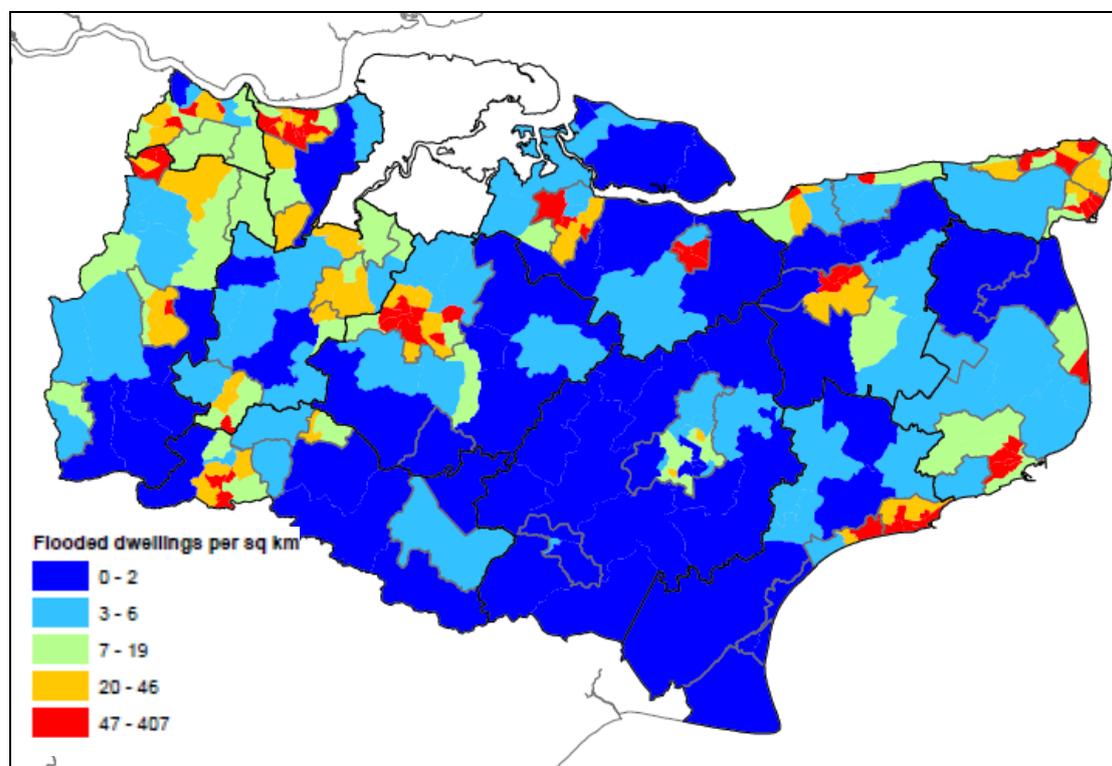
## Local flood risks

Kent has the most properties at risk of surface water flooding of all LLFAs in England, according to the EA's Flood Map for Surface Water (FMfSW). Table 1 shows the top 5 LLFAs according to number of properties at risk of surface water flooding.

Table 1 Properties at risk of surface water flooding (FMfSW >0.3m)

LLFA	Properties at risk
Kent County	75,800
Essex County	54,400
Hertfordshire County	53,000
Devon County	50,000
Hampshire County	46,600

This presents a considerable challenge in taking forward our duties under the Flood and Water Management Act 2010. Analysis of the FMfSW for our PFRA has shown that the risk of flooding from surface water is spread around the county. Figure 2 shows the distribution of residential dwellings at risk in Kent broken down into electoral wards.



**Figure 2 Distribution of dwellings at risk of flooding from 1 in 30 >0.3m surface water flood per sq km**

This data only assesses surface water flooding. Groundwater and ordinary watercourse flooding also need to be assessed in order to properly understand local flood risks and prioritise areas for investment. However, there is no reliable data for these risks that indicates the area affected and the frequency of the flooding at present. The groundwater map provided for the PFRA is coarse and provides no indication of flood frequency or volume. The Flood Map was suggested to assess the impact from ordinary watercourses, but this excludes anything smaller than 3 km<sup>2</sup> and includes the downstream impact of the main rivers. Historical data was assessed, but the distribution of historical incidents, which varied considerably across the county, reflects the local interest in data collection rather than the risk of flooding.

The historical records also do not assist with the determination of the type of surface water flooding that is indicated by the FMfSW, i.e. sewer capacity, runoff, impermeable soils etc.

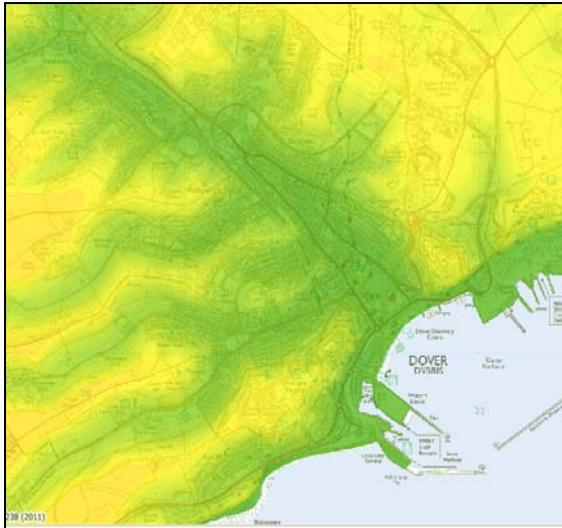
This leaves Figure 2 as the main method for prioritising flood risk management investment in Kent. Higher risk areas have been identified from this PFRA to be taken forward for further work to assess the surface water issues.

### ***Surface Water Management Plans in Kent***

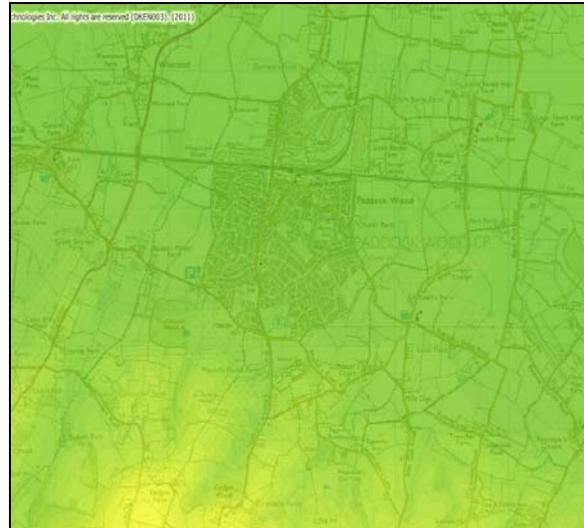
Two Surface Water Management Plans (SWMPs) have been undertaken in Kent. The Dover SWMP undertaken following Defra's SWMP grant in 2009 and delivered by KCC. The Paddock Wood SWMP was undertaken following the findings of the Stage 2 SFRA for Tunbridge Wells which identified the issues but did not provide sufficient detail for the planning inspector. The Paddock Wood SWMP was funded jointly by Tunbridge Wells Borough Council and KCC.

These two towns have very different geographies. Dover lies at the bottom of a step chalk valley with the River Dour flowing through it, which has a small capacity and many low

bridges. Paddock Wood lies in the Low Weald is flat and surrounded by a number of ordinary watercourses and a culverted main river, all of which must pass under the railway line as they flow to the north. Figure 3 shows the topographies of Dover and paddock Wood.



**Figure 3a Topography of Dover**



**Figure 3b Topography of Paddock Wood**

Despite the differences in geography both SWMPs have shown the same contrast with the FMfSW. In downstream areas the correlation between areas at risk is quite good. However, in upstream areas there are significant differences in flood risk areas. Figures 4 and 5 show comparisons of the FMfSW and the outputs from the Dover and Paddock Wood SWMPs respectively. Table 2 shows a comparison of the number of dwellings at risk of flooding.

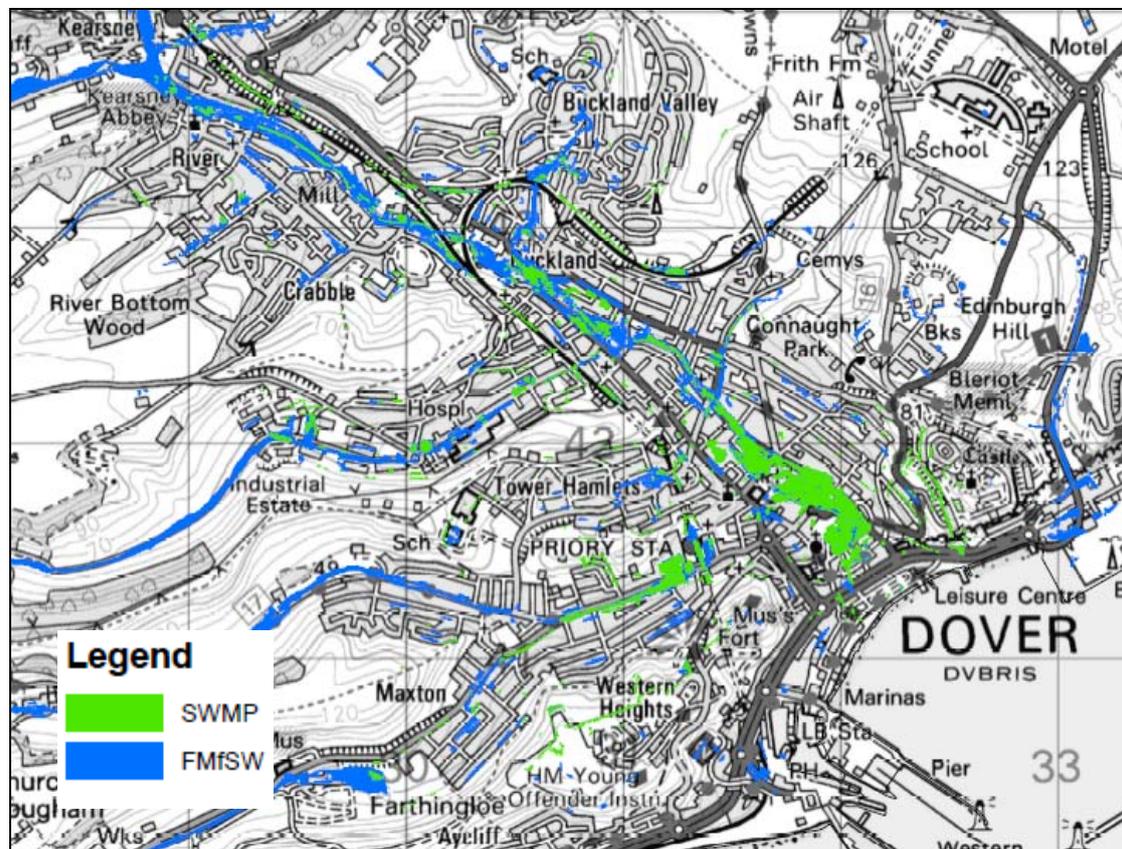


Figure 4 Comparison of FMfSW with Dover SWMP outputs

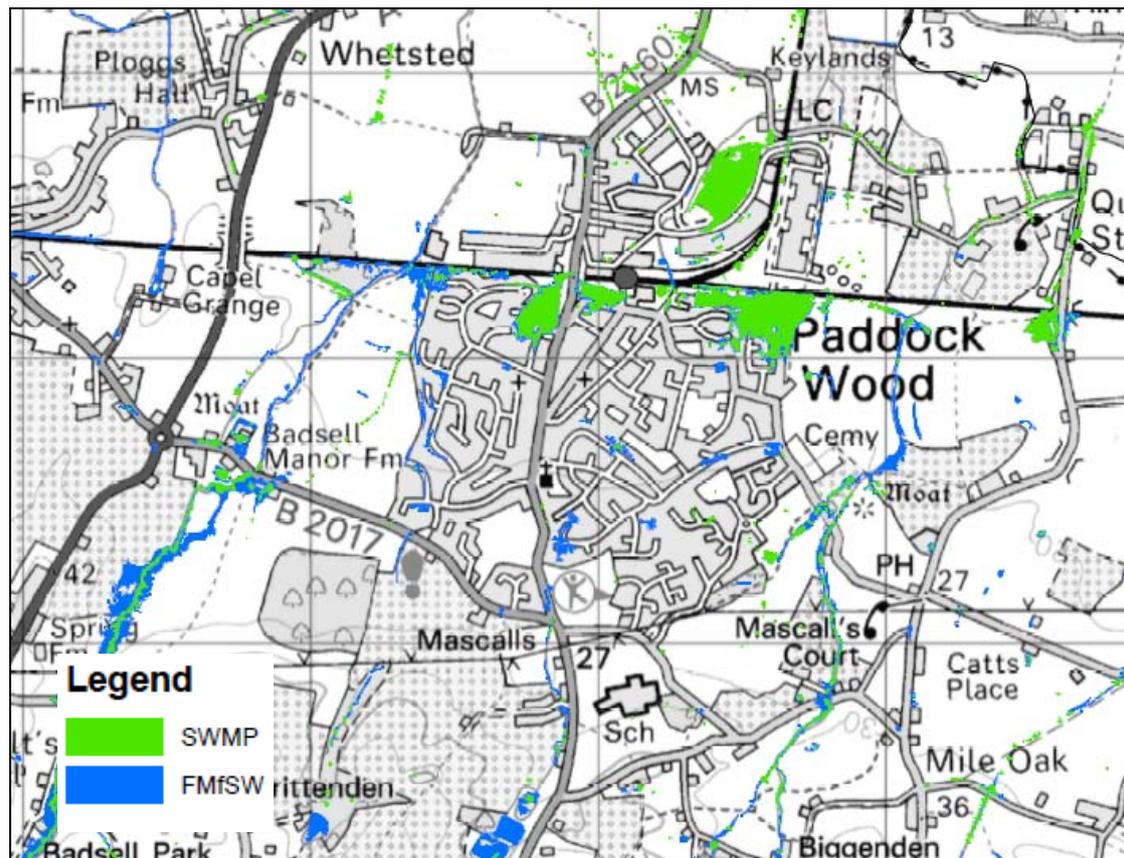


Figure 5 Comparison of FMfSW with Paddock Wood SWMP outputs

Table 2 Comparison of flooded dwellings between FMfSW and SWMPs

Data source	Dover	Paddock Wood
FMfSW	3,667	390
SWMP	2,613	167

### SWMP conclusions

It is natural to assume that the SWMP data is the more accurate and it is probably true. The SWMP models use more accurate data, they include more local features and structures and, most importantly, they include the river and sewer networks. As a consequence, the areas identified as most at risk shown in Figure 2 may be inappropriate (as may the Flood Risk Areas identified in other PFRAs).

However, it is important to remember that whilst the SWMP models may include more local feature neither they nor the FMfSW have been calibrated. They all make assumptions about the permeability of the soil, the roughness and the antecedent conditions, which cannot be validated using recorded events; at best some kind of sense check of low order return period events can be undertaken. Therefore remodelling the whole of Kent is inappropriate (as well as unaffordable) as further unreliable data, albeit with what might be considered more reasonable results, is not what is needed.

### Next steps

In the absence of any other data to assess risk with, the PFRA, based on the FMfSW, will form the basis of our approach. The areas identified for further work will have Stage 1 SWMPs undertaken. These will be based on the first quadrant of the SWMP technical

guidance project cycle, "Preparation". They involve a robust assessment of the flood history and a ground truthing of the areas identified as at risk.

The output of these Stage 1 SWMPs will be an action plan for further work identifying where additional studies/models are needed or, where there is sufficient data, actions that can be taken immediately (for instance planning policy recommendations). This will help to identify areas where there are genuine risks of surface water flooding that need further investigation, which will provide a framework to prioritise areas for investment across the county.

The areas identified are based on surface water flood risks. Further work needs to be done to assess the risks from ordinary watercourses in Kent, this will be undertaken jointly with the EA.

## ***References***

KCC, 2011, *Draft Preliminary Flood Risk Assessment*

Defra, 2009, *Surface Water Management Plan Technical Guidance: Living draft version 1*