

# Flood Map for Surface Water

Progress update on Surface Water Flood Mapping

May 2012

## Why am I being briefed?

This briefing provides an update on the Environment Agency's activities on mapping the risk of flooding from surface water. It will inform you of the latest developments and identify where we need your help.

This briefing is primarily for Lead Local Flood Authorities (LLFAs) who are managing risks from local sources of flooding, those who are involved or have an interest in local flood risk, and Environment Agency staff working with LLFAs.

## Background

Surface water flood risk management is the responsibility of LLFAs across England and Wales. Under the **Flood Risk Regulations** (the Regulations), those LLFAs in England and Wales with designated [Flood Risk Areas](#) have a responsibility to produce flood hazard and flood risk maps for surface water for these [Flood Risk Areas](#) and submit these to us by June 2013. Under the legislation, we, the Environment Agency, are responsible for publishing this data by December 2013.

As part of the Environment Agency's strategic overview (in England) and oversight (in Wales) of all sources of flood risk, we have shared two national surface water maps with LLFAs – (1) **Areas Susceptible to Surface Water Flooding** and (2) **Flood Map for Surface Water**. These maps do not fully meet the requirements of the Regulations. We know that many LLFAs have carried out local mapping, but some gaps exist. Further mapping is needed to meet the requirements of the Regulations, and there are benefits and economies of scale for consistently producing surface water flood mapping, once, for **all England and Wales**. Local information and detailed mapping from LLFAs will be used to enhance the map where possible.

For these reasons, **we plan to produce a single surface water flood map for all England and Wales**. This would benefit **all LLFAs** (particularly those without their own detailed mapping) by allowing them to focus on managing surface water flood risk; the **Environment Agency** to provide an informed picture of flooding from all sources as part of our strategic overview (in England) and oversight (in Wales) role; and **the public** to better understand how the risk of flooding may affect them, wherever they are.

## What do LLFAs need to do to satisfy the Flood Risk Regulations?

To meet the requirements of the Regulations, flood hazard mapping in Flood Risk Areas must show, for specific flood probabilities:

- the likely **extent** of flooding;
- **depth** of flooding;
- the **direction** and **speed** of flow.

# Updating Flood Map for Surface Water

In updating this map we intend to:

- use the **latest improvements** in data, technology and modelling techniques;
- **incorporate local information from LLFAs** and water companies, where appropriate;
- ensure the model is fit for purpose to **meet the needs of the Regulations**;
- **engage all LLFAs** in the update of the map, so that they understand the improvements and any limitations, and can assess which data best represents their local conditions;
- inform and support LLFAs, partners and customers in managing surface water flood risk by **sharing consistent and relevant data** in an open and transparent way;
- provide **guidance to LLFAs** about how to check if their data is in a compatible format to be incorporated into the updated Flood Map for Surface Water;
- encourage LLFAs to **generate new local surface water mapping only for 'hot spots'** where a detailed understanding of risk is needed and the updated national model outputs are unable to represent this specific local detail.

## What's happening now?

There are a number of potential improvements that could be made to the Flood Map for Surface Water. We are just completing a **pilot study** with 11 LLFAs to investigate which improvements in data, technology and modelling will be most cost effective to implement. We are agreeing the relative merits of the different improvements with these LLFAs.

At present there is no single national surface water flood map available to flood risk management authorities or the public. Consequently, we are looking into whether it's feasible and desirable to bring together existing surface water mapping to produce a national surface water flood map in the interim – potentially including the locally produced surface water mapping identified by LLFAs whilst developing their Preliminary Flood Risk Assessments – until this new improved mapping is available.

## What is happening next?

The outputs of the pilot study, due later this month, will inform the specification for updating Flood Map for Surface Water. A project to update Flood Map for Surface Water will start in June 2012. The initial outputs for Flood Risk Areas will be delivered in December 2012, and for LLFAs outside Flood Risk Areas by February 2013. A more detailed guide to key project dates is given in the Frequently Asked Questions, [below](#).

## What do we need LLFAs to do, to help us complete the work?

To develop the updated map, we want to incorporate as much local information as possible, and will rely on LLFA input to achieve this.

In June 2012, we will provide guidance on surface water modelling. This will outline how all LLFAs can check if their existing and future detailed surface water mapping is compatible with national mapping and compliant with the Regulations.

To gain the maximum benefit from updating Flood Map for Surface Water, we would like LLFAs to provide us with some information about their area **before** we start modelling, so we can take account of local knowledge. **We need LLFAs to provide us with information, for example in relation to drainage rates and critical storm durations, by mid July 2012.** Water companies may be able to help LLFAs to assemble this information. We will shortly be sending out a request to LLFAs, explaining what we need.

We recommend LLFAs set aside time to review the national mapping (between Dec 2012 and June 2013). Local Environment Agency staff will support LLFAs through the review process. We will ask LLFAs to consider whether the updated national mapping, or any locally produced detailed data, best represents flood risk locally. Once LLFAs have decided on the information that best represents their local surface water flood risk, we will ask them to submit it to us by June 2013.

Where possible, detailed mapping from LLFAs will be combined with the national mapping to produce the updated Flood Map for Surface Water and will be shared with LLFAs between June 2013 and December 2013. We will work with the Local Government Association and LLFAs to agree exactly how the updated map should be made available.

## How does this link to other work on the Flood Risk Regulations?

This project is a key output required to deliver the Flood Risk Regulations. We are aiming to provide an update in June on progress with the overall Flood Risk Regulations project. This will include outputs from our reporting to Europe on Preliminary Flood Risk Assessments. We are also planning a consultation on the approach to delivering Flood Risk Management Plans in June.

Flood hazard maps and flood risk maps as required to meet the requirements of the Regulations will be published on our website by December 2013.

### Where can I go for further information?

If you have any comments on these proposals or have any further questions not answered by the 'frequently asked questions' attached, please contact [Shirley Greenwood](#).

**Flood and Coastal Risk Management Mapping and Modelling, National Office  
Environment Agency**

# Frequently asked questions

## Why are there two different national surface water flood maps?

In 2009, we released **Areas Susceptible to Surface Water Flooding (AStSWF)** for use by Local Resilience Forums, Lead Local Flood Authorities, and other Local Authorities, in support of the Environment Agency's Strategic Overview (in England) and Oversight (in Wales) and in response to the Pitt Review recommendations. We followed this up in 2010, with the **Flood Map for Surface Water (FMfSW)** (so called to distinguish it from the flood map for rivers and the sea), which made different assumptions on rainfall and drainage systems.

A number of Lead Local Flood Authorities (LLFAs) considered that AStSWF, whilst a simpler dataset, represented their local drainage conditions better. We have currently two datasets being used, in parallel with locally developed data, by Local Authorities to establish local flooding from surface water.

## Why are we planning to update the FMfSW?

The AStSWF and FMfSW do not meet the requirements of the Regulations and are not as good as they need to be to support flood risk management for the following reasons:

- The Regulations require LLFAs with areas identified at 'significant' risk of local flooding in England and Wales ('Flood Risk Areas') to prepare Flood Hazard Maps for local flooding, and require the Environment Agency to publish these maps by December 2013. Current national mapping does not meet all of the needs set out in the Regulations.
- Some LLFAs have produced local, more detailed flood mapping which is more representative than national mapping; however it does not always meet all of the specific needs set out in the Regulations (for example, for particular flood probabilities, or for depth and velocity data).
- To fulfil our role of strategic overview / oversight we need to understand the distribution of surface water flood risk across **all of England and Wales**, not just in Flood Risk Areas.
- Government has set expectations that surface water flood mapping will be updated, improved and published.
- National information on surface water flooding is not currently available in one place, nor is it available to the public.
- Improvements in data, modelling software and technology mean that it is now feasible to make substantial improvements to surface water flood mapping at a national scale, to underpin locally produced detailed mapping. We are able to refine the assumptions in the model to produce a more accurate picture of surface water flooding for England and Wales.

## Where are the pilot tests being carried out?

Pilot testing has been completed in the following 11 LLFA areas in England and Wales: Bournemouth Borough Council, Ceredigion County Council, Conwy County Borough Council, Dudley Metropolitan Borough Council, East Riding of Yorkshire Council, Gloucestershire County Council, Hull City Council,

London Borough of Redbridge, Rhondda Cynon Taf County Borough Council, Rochdale Metropolitan Borough Council, and Torbay Council.

## What are the key dates for the project?



## What improvements have been made in data, technology and modelling techniques?

Limitations in previous modelling	Improvements
Digital terrain models	Significantly more LIDAR data is now available in urban areas. We can consider refining the resolution of the model and, for example, represent urban flow paths more accurately.
Representing buildings	Represent buildings differently in the model, for example, using the ‘stubby buildings’ method.
Urban runoff and urban drainage	Incorporate more local information on the spatial variation of urban runoff or drainage.
Infiltration	Incorporate more local information on spatial variation of infiltration rates.
Rainfall inputs (intensity and duration)	Incorporate more local information on the critical storm duration for relevant flood probabilities.
Model software	Produce more accurate and reliable depth and velocity data. Model run-times are shorter and allow us to refine the resolution of the model.



## How will the updated FMfSW improve on previous national modelling?

The updated FMfSW will improve greatly upon the FMfSW shared in Nov 2010, and the Areas Susceptible to Surface Water Flooding maps shared in July 2009. The updated FMfSW will:

- address some of the known modelling limitations;
- combine local and national datasets to provide an improved and nationally consistent picture of surface water flood risk;
- incorporate improvements in modelling techniques, understanding and data;
- incorporate detailed local surface water flood risk data from LLFAs where it is compatible;
- meet the requirements of the Regulations by providing flood water depth and velocity information at a range of flood probabilities.

## Will the criteria for inclusion of 'appropriate' local detailed data be very stringent?

We plan to make the criteria for appropriate local data as flexible as we can. Certain criteria will be fixed - for example, the mapping will have to reflect the correct flood probabilities, and will have to include depth and velocity information. Also, the data will have to be in an appropriate format so that we can combine it with data from other LLFAs. But we won't, for example, define software.

LLFAs will be able to submit local detailed mapping for all or part(s) of their area but must agree what is appropriate for their whole area.

We are working with a small group of LLFAs to understand their existing data so that we can keep the data format as simple as possible.

## Why doesn't the Environment Agency just adopt the updated national mapping everywhere instead of asking LLFAs to assess 'locally agreed surface water information' again?

We believe that an updated FMfSW will improve upon the existing FMfSW in many places. We recognise that some LLFAs have already invested in local detailed surface water flood modelling and mapping. Indeed, there are some places where only detailed modelling and mapping will enable complex systems to be represented adequately, and it is this data that LLFAs use for managing this local flood risk.

The Environment Agency, the public, and a range of partners also need to understand surface water flood risk, and it makes sense for everyone to use the same information to do this. Consequently we want to use this opportunity to pull all the data together into one map. We will also put a process in place to allow the map to be updated with appropriate information.

## Will this help all LLFAs, or just those with Flood Risk Areas?

This work can help all LLFAs. The statutory requirement to publish surface water flood mapping under the Flood Risk Regulations only applies to LLFAs with Flood Risk Areas identified during Preliminary Flood Risk Assessments. But all LLFAs need to produce Local Flood Risk Management Strategies, and so all LLFAs need to understand and manage local flood risk. By updating data for all England

and Wales, a consistent set of data will be available everywhere. This means that LLFAs can concentrate their resources on detailed mapping of hotspots and on managing flood risk, rather than spreading their limited resources more thinly.

## **Do you want to publish the data?**

We don't currently publish surface water flood mapping, because at present it is piecemeal and not consistent. However, surface water flood risk affects the public, and unless people are aware that they are in an area at risk of flooding, they will not be able to take action to reduce their risk. As LLFAs manage these risks and will be engaging with communities on this as part of the process to produce local flood risk management strategies, we want to publish these maps in partnership with LLFAs. We intend to discuss and work with the Local Government Association and LLFAs on this in due course.

In December 2012 Defra's Minister, Richard Benyon MP, said that 'we propose to... continue to improve the quality and availability of flood risk maps published by the Environment Agency including surface water flooding maps, so that individuals and communities can be more aware of levels of local flood risk and better informed about what action could be taken at an appropriate level to provide better protection.' We want to be transparent, and share and explain the data we hold, so that people and communities can understand their flood risk and be prepared for flooding. This is consistent with the approach we have taken by publishing maps showing areas at risk of flooding from rivers and the sea since 1999.

## **The Flood Risk Regulations require maps to be published in December 2013. What are you going to do before then?**

As part of the Preliminary Flood Risk Assessment under the Regulations, LLFAs determined which maps, or other information, best represents surface water risk in their area. We are currently working to review this locally agreed picture to determine what mapping customers need access to, in order to give them the best representation of local risk. We will work with LLFAs to decide how best to make the existing data available in a meaningful, uncomplicated way, with a view to making some existing surface water mapping available by the end of 2012, for use until the updated mapping is available.

## **How can the maps be consistent if you are combining maps from different places with different levels of detail?**

We describe the planned updated Flood Map for Surface Water as 'consistent' because we will need to ensure a minimum level of consistency. For example, we want to make sure that the same likelihoods of flooding, and the presence of drainage systems, are modelled everywhere. In some places, local modelling will represent drainage systems with a lot more detail than the national modelling can, but the principles will be consistent everywhere. This is the way that the Environment Agency's Flood Map for rivers and sea has been built up. This principle recognises the need for a base level of information everywhere, but more detail is gradually added as new mapping is produced.

## **Who will maintain the national surface water flood mapping after December 2013?**

We want to ensure that an up-to-date national surface water flood map is available for use locally and nationally. We don't plan to carry out another full national modelling exercise after 2013, but we know that LLFAs are likely to want to do some additional local modelling, and so we plan to make sure that LLFAs can use their part of the updated national model after 2013. We also want to make it easy for LLFAs to merge their updated local mapping into the national map, so that all flood risk management authorities are using the same data. We are currently developing a system, which will be accessible to LLFAs but hosted and supported by the Environment Agency, to help with this. We will involve LLFAs in testing this new system and preparing guidance.