



## Guidance on surface water flood mapping for Lead Local Flood Authorities

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We operate at the place where environmental change has its greatest impact on people's lives. We reduce the risks to people and properties from flooding; make sure there is enough water for people and wildlife; protect and improve air, land and water quality and apply the environmental standards within which industry can operate.

Acting to reduce climate change and helping people and wildlife adapt to its consequences are at the heart of all that we do.

We cannot do this alone. We work closely with a wide range of partners including government, business, local authorities, other agencies, civil society groups and the communities we serve.

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## **Executive summary**

This document applies to risk management authorities including Lead Local Flood Authorities (LLFAs) and Internal Drainage Boards and any person involved in developing surface water flood mapping on their behalf.

The updated Flood Map for Surface Water will combine local detailed mapping with national mapping to form a single source of surface water flood mapping for England and Wales. The Environment Agency is required to publish hazard and risk mapping for Flood Risk Areas to fulfil the requirements of the Flood Risk Regulations 2009 (the Regulations) by December 2013.

This document explains how LLFAs can check if their surface water flood mapping is compatible with the national mapping, and therefore can be incorporated in the updated Flood Map for Surface Water. This document suggests what LLFAs can do if they already have surface water flood mapping, are carrying out or are thinking about carrying out new mapping to make it compatible with the national mapping.

The main body of the guidance provides information on surface water flood mapping for non-technical LLFA staff. The appendices provide further details to enable someone with modelling experience to assess whether local mapping can be incorporated into the planned update to the Flood Map for Surface Water.

The information in the appendices provides more detailed recommendations of the parameters to use in the modelling and those which are important to make the mapping compatible with the national scale surface water flood mapping. The appendices are not intended to provide a comprehensive technical specification for modelling.

The appendices are focused towards staff with some knowledge and experience of modelling, and therefore do not provide a step-by-step guide to modelling for non-modelling staff.

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## 1 Introduction

As part of the Flood Risk Regulations 2009 (the Regulations), the Environment Agency has a strategic overview (England) and oversight (Wales) of flooding from all sources, including surface water. Surface water flood risk management is the responsibility of LLFAs across England and Wales.

There are four main stages to put the Regulations into practice:

- 1. Preliminary (flood risk) Assessment Report
- 2. Identify Flood Risk Areas
- 3. Flood hazard maps (showing flood extent, depth and velocity) and flood risk maps (showing the consequences of flooding) for Flood Risk Areas
- 4. Flood Risk Management Plans (FRMPs) for Flood Risk Areas.

The Environment Agency has shared two national surface water flood maps with local authorities – (1) Areas Susceptible to Surface Water Flooding and (2) Flood Map for Surface Water as part of our strategic overview (in England) and oversight (in Wales).

LLFAs used these datasets as well as local detailed mapping to identify which mapping was most representative for their area. LLFAs used their 'locally agreed surface water information' to identify **Flood Risk Areas** as part of their **Preliminary Flood Risk Assessments**.

LLFAs have a responsibility to produce **flood hazard and flood risk maps** for surface water for the designated Flood Risk Areas and submit these to us by June 2013. The Environment Agency is responsible for publishing this data by December 2013.

The Environment Agency is developing new national scale surface water flood mapping. This will provide flood hazard mapping that meets the requirements of the Regulations, and can be used for Flood Risk Areas where appropriate local mapping is not available. This means that LLFAs are not obliged to update or create any new surface water flood mapping in the next 12 months solely to comply with the Regulations.

### 1.1 What if LLFAs don't have any Flood Risk Areas?

Not all LLFAs have a Flood Risk Area, but this guidance is still relevant to LLFAs with detailed mapping from local modelling studies or those considering carrying out detailed mapping in the near future.

The new national scale surface water mapping offers benefit for all LLFAs, particularly those who currently use the Flood Map for Surface Water or Areas Susceptible to Surface Water Flood map as their 'locally agreed surface water information'. This is because the new map will better represent spatial variation in local conditions.

Moreover, the updated Flood Map for Surface Water will incorporate not only the new national scale mapping, but also any compatible local mapping from LLFAs across England and Wales, whether or not it is was created for a Flood Risk Area to meet the requirements of the Regulations.

The updated Flood Map for Surface Water will therefore provide the best single picture of surface water flood risk for all England and Wales and will continue to be updated and enhanced with any new local detailed mapping as it becomes available. This map can be used for all areas, not just Flood Risk Areas.

All LLFAs will be able to use the updated Flood Map for Surface Water for local planning, decision-making, and flood risk management, including informing people of the risk of flooding.

## 1.2 Will the mapping take into account other sources of local flood risk?

This national scale surface water flood mapping will not explicitly map all forms of local flood risk. Surface water flood risk was identified as a potentially significant source of flooding as part of the Preliminary Flood Risk Assessments. Ordinary watercourses and groundwater were not identified as posing such a significant risk. Surface water flooding is largely influenced by the local topography, so in many places the areas that would flood from ordinary watercourses and ditches will also be mapped in the updated surface water flood map.

This national scale surface water flood mapping will not assess interactions between sources of flood risk, but, as part of the Regulations, LLFAs will need to consider interactions between local sources of flood risk and flood risk from rivers and the sea when managing local flood risk.

## 2 Updating the Flood Map for Surface Water

The updated national scale surface water flood mapping will improve upon the Areas Susceptible to Surface Water Flooding maps and the Flood Map for Surface Water for the majority of England and Wales by using better data and modelling techniques and improving how we use local data. We will share this new national scale surface water flood mapping with LLFAs in early 2013.

LLFAs will need to decide which information, the national scale surface water flood mapping or local, more detailed mapping, best represents surface water flooding in their area. We will incorporate any compatible local mapping into the updated national mapping to form the updated Flood Map for Surface Water.

The updated Flood Map for Surface Water will be the best single source of information on surface water flooding for England and Wales for our partners and the public. The updated Flood Map for Surface Water will also meet the requirements of the Regulations for hazard mapping within Flood Risk Areas.

### 2.1 Why are we updating the Flood Map for Surface Water?

### To meet the requirements of the Regulations

#### LLFA and EA responsibilities

The Regulations set out the requirements for producing flood hazard maps for flooding from local sources of flooding, the rivers, the sea, and reservoirs.

LLFAs have a responsibility to provide flood hazard mapping for Flood Risk Areas. Flood Risk Areas are areas identified in a Preliminary Flood Risk Assessment as being affected by a significant flood risk.

As part of our strategic overview (in England) and oversight (in Wales), 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 still 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 new surface water flood map for all England and Wales. This would benefit 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, by ensuring that they can access the best information to help them to understand how the risk of flooding may affect them, wherever they are.

### Flood hazard mapping

The term 'hazard' has been described in previous research as a combination of the effects of water depth, velocity and debris. This guidance uses the term to mean 'hazard' as described in the Regulations, which defines flood hazard maps as showing:

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

To meet the requirements of the Regulations, we will assess floods with the following chance of occurring in any given year (annual probability in brackets):

- 1 in 30 (3%)
- **1 in 100** (1%)
- **1 in 1000** (0.1%)

The existing national scale surface water flood maps do not provide all of this information. The updated national scale surface water flood mapping will provide more reliable flood water depth and velocity information, and will address the flood probabilities outlined in the Regulations. The updated national scale surface water flood mapping will meet the requirements for hazard mapping for Flood Risk Areas set out in the Regulations, as well as providing hazard mapping for all England and Wales.

### To incorporate local improvements in surface water mapping

The updated Flood Map for Surface Water will combine the updated national scale surface water flood mapping with local detailed surface water flood mapping from LLFAs, where appropriate local data exists, resulting in a map that better represents spatial variation in local conditions.

### To address areas for improvement in the existing model

Modelling techniques, technology and data have improved since the Flood Map for Surface Water was developed and shared in 2010. We are able to refine the assumptions in the model to produce a more accurate picture of surface water flood risk for England and Wales. The table below outlines the improvements in modelling techniques, understanding and data that make an update to the national scale surface water flood mapping worthwhile.

Areas of improvements	Expected benefit	Reason for improvement
Digital terrain models	Better representation of flow paths and buildings; better depth, velocity and extent information.	There is evidence that flow paths are strongly influenced by small scale features. 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.
Representation of buildings	Better depth, velocity and extent information.	There is evidence that buildings strongly influence flow paths and can act as permeable barriers. There are several new methods to represent buildings more realistically in the model.
Drainage and infiltration modelling	Better depth, velocity and extent information, and representation of probability of flooding. Better accounting for infiltration and drainage system losses.	There is evidence of a wide variation in drainage capacity and infiltration rates. The land use has a strong influence on the way water on the surface behaves. Local information on drainage capacity, surface infiltration, and land use can be incorporated into the model where it is available.
Rainfall profile, storm probabilities and duration	More detail on the probability of rainfall inputs.	There is evidence that the duration and intensity of a rainfall storm that causes the most flooding varies widely between areas. Flood water velocities are influenced by the rainfall intensity and duration. Local information can be incorporated into the model where available.
Model software and equations	Better prediction of velocity.	The modelling software can produce more accurate and reliable depth and velocity information using more detailed mathematical equations.

### 2.2 How will this improve on previous mapping?

The updated Flood Map for Surface Water will improve upon the Flood Map for Surface Water shared in November 2010, and the Areas Susceptible to Surface Water flood maps shared in July 2009 for the majority of England and Wales. The updated Flood Map for Surface Water will:

- address areas for improvement in the modelling by incorporating improvements in modelling techniques, understanding and data;
- combine detailed local surface water flood mapping from LLFAs (where it is compatible) with national mapping to provide an improved and consistent picture of surface water flood risk;

- meet the requirements of the Regulations by providing flood water velocity and depth information for a range of flood probabilities, where local detailed mapping is not available;
- allow us to publish surface water flood information for Flood Risk Areas in December 2013 to meet the requirements of the Regulations.

The updated national scale surface water flood mapping, although an improvement, will still make assumptions in the model. For example:

- whilst we now have improved terrain information for over 90% of urban areas in England and Wales, there will still be some areas where we use the terrain information as used in previous modelling;
- the complexity of how water flows in urban areas, combined with the limits on computer processing power and information going into the modelling means that we may not be able to represent all details in urban areas;
- where known drainage capacity data is available, the data will guide the assumptions in the model and will better represent reality; but where there is no capacity data available, broad assumptions will be included in the model;
- the updated mapping will take into account new data and modelling techniques to improve the quality of mapping for the majority of England and Wales. The updated mapping may produce similar patterns of surface water flooding to previous national scale mapping; this may be due to certain factors such as the characteristics of the catchment, rather than little or no improvement in the data or modelling techniques used to produce the mapping.

### 2.3 Future use of the national scale surface water flood model

The national scale surface water flood model will be divided into a set of self-contained models for each LLFA area in England and Wales. This will give LLFAs an opportunity to re-run their part of the national scale model with any better local understanding of model parameters in the future. The models will be available to each LLFA during 2013.

### 2.4 Timeline to December 2013

The timeline below sets out the main tasks for LLFAs and the Environment Agency between May 2012 and December 2013 to enable us to create the updated Flood Map for Surface Water and meet the requirements of the Regulations for Flood Risk Areas.

Мау	$\bigcap$	
		Environment Agency - Start carrying out national scale surface water flood mapping for England and Wales, to be completed by Feb 2013.
		LLFAs - Carefully consider whether you need to do any new local surface water flood mapping within the next 6 to 12 months.
	2012	LLFAs - We recommend you <u>do not</u> carry out mapping where your sole reason is to meet the requirements of the Regulations or where the sole reason is that the existing national mapping is not representative. The updated FMfSW will produce mapping that will be suitable for the Regulations and will improve on previous national modelling.
Dec	$\bigcup$	<b>LLFAs</b> - If you do decide to update or develop new surface water flood mapping during 2012, we recommend that the outputs are compatible with the national scale mapping and the Regulations and follow the guidance in this document.
	$\bigcap$	LLFAs with Flood Risk Areas - National scale mapping will be available from December 2012.
Feb		LLFAs outside Flood Risk Areas - National scale mapping for the remainder of England and Wales will be available by end of February 2013.
		<b>LLFAs</b> - Consider the national scale mapping alongside your local information; agree your best and most representative surface water flood mapping information and submit appropriate local data to the Environment Agency by June 2013.
	2013	LLFAs - In light of the national scale surface water flood mapping, you may consider whether you would still like to do any further mapping. We recommend that the outputs are compatible with the national mapping and follow the guidance here.
June		LLFAs and Environment Agency - Tool available to store and share surface water flood information.
		LLFAs and Environment Agency - Combine local and national datasets to form updated national scale surface water flood map.
Dec		<b>Environment Agency</b> - In accordance with the requirements of the Regulations, publish surface water flood maps for Flood Risk Areas on Environment Agency website in December 2013.
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## 3 The next steps for LLFAs

The following sections of the guidance apply to any surface water flood mapping that LLFAs carry out, regardless of the purpose. This guidance does not just apply to surface water flood mapping within Flood Risk Areas because any local mapping may be incorporated in the updated Flood Map for Surface Water.

If you are already updating or are planning to update your mapping within your LLFA area, for any purpose in the next 12 months, we recommend you use this guidance for direction.

The Flood Map for Surface Water, updated with compatible local and national scale mapping, will meet the requirements for flood hazard mapping set out in the Regulations. National mapping will be used where local mapping is not available. This means you are under no obligation to produce any new mapping to comply with the Regulations within the next 12 months. It is your decision whether to carry out detailed surface water flood mapping in your area according to your own local needs. Any new compatible mapping can be incorporated into the updated Flood Map for Surface Water if it is supplied to the Environment Agency by June 2013.

It is important that any local mapping you decide is needed is compatible with the national mapping and compliant with the Regulations. It will not be possible to incorporate incompatible local data into the updated Flood Map for Surface Water.

### 3.1 Format of the guidance

We recognise that each LLFA has reached a different stage in the process of understanding flood risk from surface water. We have divided the guidance into four sections to reflect the positions that the majority of LLFAs will be able to relate to. Each LLFA is likely to identify with one or more of the following groups:

- 1. LLFAs with existing mapping from Surface Water Management Plans, surface water mapping in Wales, Preliminary Flood Risk Assessments or for other local purposes;
- LLFAs carrying out, or about to carry out mapping where there is an urgent business need to inform decision-making within the next 12 months;
- 3. LLFAs considering undertaking mapping within the next 12 months because they have funding available and the existing national mapping (Flood Map for Surface Water and Areas Susceptible to Surface Water flood maps) are not representative in their area;
- 4. LLFAs who are not considering doing any mapping in the next 12 months.

The flow chart below may help you to find the most relevant section(s) of the guidance for your circumstances, although it's likely that more than one will apply to many LLFAs.



### 3.2 Making use of local information

Regardless of your current stage in the process of understanding surface water flood risk, we encourage you to continue to:

- **record local flood data** for example, photographs, reports, measurements, newspaper articles, anecdotal data from residents, and use it to compare with the most recent surface water flood mapping;
- **compile useful information** on surface water flood risk, for example:
  - o identify drainage system capacity, in particular urban drainage rates;
  - **assess how areas respond to rainfall**, such as how quickly an area responds to intense or prolonged rainfall.

Once the Environment Agency has shared the updated mapping with you in early 2013, we recommend you:

- use your recorded local flood data to compare against the updated Flood Map for Surface Water maps; note that the Flood Map for Surface Water only represents surface water flooding and does not represent flooding from other mechanisms or sources such as sewer flooding, flooding from ordinary watercourses, groundwater, or flooding from rivers or the sea;
- where you are confident in your local recorded information, including local mapping, use it to understand how well the national mapping represents reality;
- if you have local mapping, identify **which data is most representative** of the flood risk in your area, and how much confidence you have in that data;

• identify whether there is an **urgent need** for more detailed mapping to support decision making, and only then consider carrying out new mapping.

### 3.3 Further detailed guidance

Further detailed information on preparing information for the Flood Map for Surface Water will be available in the following appendices when we plan to update this guidance document in October 2012:

- <u>Appendix 1</u> Guidance on how to make mapping compatible with national mapping and compliant with the Regulations
- <u>Appendix 2</u> What to consider before submitting your modelling to the EA to be incorporated into the updated Flood Map for Surface Water
- <u>Appendix 3</u> How to make your digital mapping into a compatible format to be incorporated into the updated Flood Map for Surface Water
- <u>Appendix 4</u> How to determine your new locally agreed surface water mapping
- <u>Appendix 5</u> Your questions answered

# 4 LLFAs with detailed mapping

You may have produced local detailed mapping for Surface Water Management Plans in England, surface water mapping studies in Wales, Preliminary Flood Risk Assessments or for other local purposes.

### 4.1 Timeline to December 2013

The timeline below sets out the main tasks for LLFAs and the Environment Agency between May 2012 and December 2013 to enable us to create the updated Flood Map for Surface Water and meet the requirements of the Regulations for Flood Risk Areas.

Мау	$\cap$	
		Environment Agency - Start carrying out national scale surface water flood mapping for England and Wales, to be completed by Feb 2013.
		LLFAs - Assess whether your existing mapping is compatible with the national scale mapping and the Regulations, using this guidance.
	2012	LLFAs - If already compatible, compliant, and in the correct format, then you do not need to do any further work until Dec 2012 when the updated national scale mapping will be shared.
		LLFAs - If not compatible, consider whether it is worthwhile carrying out further work. Carefully consider the time, effort and cost involved in further mapping. You may consider waiting for the results of the national scale mapping before making major changes to your mapping to make it compatible.
Dec	U	LLFAs - If you do decide to update or develop new surface water flood maps by June 2013, we recommend that the outputs are compatible with the national scale mapping and follow the guidance here.
	$\cap$	LLFAs with Flood Risk Areas - National scale mapping will be available from December 2012.
Feb		<b>LLFAs outside Flood Risk Areas</b> - National scale mapping for the remainder of England and Wales will be available by end of February 2013.
		<b>LLFAs</b> - Consider the national scale mapping alongside your local information; agree your best and most representative surface water flood information and submit appropriate local data to the Environment Agency by June 2013.
	2013	LLFAs - In light of the national scale surface water flood mapping, you may consider whether you would still like to do any further mapping. We recommend that the outputs are compatible with the national scale mapping and follow the guidance here.
June		LLFAs and Environment Agency - Tool available to store and share surface water flood information.
		LLFAs and Environment Agency - Combine local and national datasets to form updated national scale surface water flood map.
Dec		Environment Agency - In accordance with the requirements of the Regulations, publish surface water flood maps for Flood Risk Areas on Environment Agency website in December 2013.

# 4.2 Can we use your local information in an England and Wales single set of information on surface water flood risk?

Further detailed information is given in Appendices 1, 2 and 3 on how to ensure your modelling and mapping is compatible with national mapping and compliant with the Regulations. This includes some mandatory minimum standards for the modelling and mapping and some further recommendations for good practice.

You are under no obligation to update your modelling and mapping to make it compatible and compliant. The new national mapping will produce depth and velocity information that will meet the requirements of the Regulations.

However, we all want to make the best use of your local mapping to ensure that we have a shared picture of flood risk from surface water. Consequently we would like to incorporate it into the updated Flood Map for Surface Water. In this case, you will need to consider how your models were created, what data they produced, and whether there are any gaps or differences between the national scale modelling and mapping requirements, and your local modelling and mapping. If there are differences and gaps, you may want to carry out further work to make your local data compatible with the national data and the Regulations.

### 4.3 Common issues

There are three common issues that you may identify in your mapping which could make it incompatible or non-compliant with the Regulations:

- probability of flooding occurring not all probabilities (see section 2.1 for details) may have been considered to meet the requirements of the Regulations; consider running the model again to include additional probabilities;
- **depth and velocity** data reliable depth and velocity data may not have been produced in previous mapping; consider running the model to produce this information;
- **format** of the datasets for example, the grid size, resolution, categorisation may need further work to make it compatible; consider the need to process the data to meet the data specification and formatting requirements.

### 4.4 How much further work is needed?

The amount of additional work required to make your mapping compatible with the national mapping will depend on how well the existing information matches the mandatory minimum requirements in Appendix 1.

It is possible that your existing modelling and mapping will need some further work to make it compatible with the national mapping and compliant with the Regulations.

The time, cost and effort involved in upgrading your models will be dependent on the number and type of modelling factors and parameters that need to be changed. It may be possible to make your modelling compatible and compliant, for minimal time, cost and effort if there are only a small number of changes to make. See the table below for more information. The overall score is based on a modeller's assessment of time, effort and cost (1=minimal; 5=significant).

Factor	Score	What needs to be done? What do you need to be aware of?
Suitability of software	5	Changing modelling software can mean that the model needs to be re-built.
Probability of flood occurring in any year	2	Run the existing model with updated flood probabilities.
Grid size and DTM	3	Incorporate most representative available digital terrain data. Re-create part of 2D model, re-define the model grid size or resample the model outputs to meet the grid size specification, and run the models again.
Representation of buildings and surface roughness	3	Make changes to the method used to represent buildings and surface roughness in the model by updating the model input data updated, and run the models again.
Storm duration / Infiltration / Drainage capacity	3	Make changes to the modelling parameters and run the models again to incorporate the changes.
Depth and velocity	2	Re-run 2D model to produce depth and velocity outputs for additional flood probabilities.
Direction of flow data	2	Post-processing raw model outputs using a method defined as a result of the surface water pilot study.
Post-processing digital outputs	1	Post-processing the raw model outputs using new criteria.

If you have identified several changes that you will need to make to the modelling parameters, or identified any complex issues in making your modelling compatible and compliant, then we recommend that you consider the following prior to the release of the new national mapping (in early 2013):

- whether it is necessary to update the existing model to make it compatible and compliant;
- the time, cost and effort involved in updating the modelling.

Now look at the <u>flow chart in section 3.1</u> to consider which other sections of the guidance may also be relevant to you.

# 5 LLFAs carrying out, or about to carry out mapping

You may be carrying out a study at the moment or plan to carry out mapping, where there is an urgent business need to inform decision-making in the next 6-12 months.

### 5.1 Timeline to December 2013

The timeline below sets out the main tasks for LLFAs and the Environment Agency between May 2012 and December 2013 to enable us to create the updated Flood Map for Surface Water and meet the requirements of the Regulations for Flood Risk Areas.

Мау	$\bigcap$	
		Environment Agency - Start carrying out national scale surface water flood mapping for England and Wales, to be completed by Feb 2013.
		LLFAs - If you are in the process of carrying out some mapping, we recommend that you make sure it is compatible with the national scale mapping and the Regulations, using the guidance here.
	2012	LLFAs - If you are considering producing mapping within the next 12 months, we recommend you carefully consider if there is an urgent need to do so to support decision-making within this timescale. If you can, we recommend you postpone your decision until the national mapping is shared in Feb 2013.
		LLFAs with Flood Risk Areas - We recommend you <u>do not</u> carry out mapping where your sole reason is to meet the requirements of the Regulations. The updated FMfSW will be suitable for this purpose.
Dec	U	LLFAs - If you do decide to carry out new mapping, we recommend that you use this guidance to make sure it is compatible with the national mapping and the Regulations.
		LLFAs with Flood Risk Areas - National scale mapping will be available from December 2012.
Feb		<b>LLFAs outside Flood Risk Areas</b> - National scale mapping for the remainder of England and Wales will be available by end of February 2013.
		<b>LLFAs</b> - Consider the national scale mapping alongside your local information; agree your best and most representative surface water flood information and submit appropriate local data to the Environment Agency by June 2013.
	2013	LLFAs - In light of the national scale surface water flood mapping, you may consider whether you would still like to do any further mapping. We recommend that the outputs are compatible with the national scale mapping and follow the guidance here.
June		LLFAs and Environment Agency - Tool available to store and share surface water flood risk information.
		LLFAs and Environment Agency - Combine local and national datasets to form updated national scale surface water flood map.
Dec		Environment Agency - In accordance with the requirements of the Regulations, publish surface water flood maps for Flood Risk Areas on Environment Agency website in December 2013.
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### 5.2 LLFAs already carrying out mapping

If you are already carrying out some local mapping we recommend that you use this guidance to check if your mapping will be compatible with the national mapping, so it can be incorporated into the Flood Map for Surface Water and compliant with the Regulations, and update your mapping where possible. Use the information in Appendix 1, 2 and 3 to check if your modelling and mapping is compatible with the national modelling and mapping and compliant with the Regulations.

# 5.3 LLFAs about to carry out new mapping where there is an urgent need

The Environment Agency recognises that LLFAs may wish to update or develop new surface water flood risk models prior to the new national mapping being shared in early 2013.

We recognise that there are many reasons that you may need to carry out surface water flood mapping, aside from mapping within Flood Risk Areas, for example:

- to better understand mechanisms and risk of flooding in complex drainage areas;
- to better understand the scale and spatial distribution of investment in flood risk management and to inform Local Flood Risk Management Strategies;
- to support specific planning and development of local drainage schemes and to better assess the options in areas that are known to flood;
- to support emergency and spatial planning;
- to raise public awareness of flood risk, so they can take actions.

If you are planning to carry out mapping within the next 12 months, we recommend you carefully consider if there is an urgent need to do so to support important decision-making prior to February 2013. If you can, we recommend you postpone your decision to do further mapping until the national mapping is shared with you in early 2013, as this will give you a better base set of information to build on, and may save you substantial time and money in tailoring it to your local needs.

If you do decide to carry out mapping within the next 12 months, we recommend that you use this guidance to make your mapping compatible and compliant with the Regulations. Use the information in Appendix 1, 2 and 3 to check if your mapping is compatible with the national mapping and compliant with the Regulations.

Now look at the <u>flow chart in section 3.1</u> to consider which other sections of the guidance may also be relevant to you.

# 6 LLFAs considering undertaking mapping in the next 12 months

You may be considering undertaking mapping in the next 12 months because the existing national mapping is not representative of the surface water flood risk in your area and you have secured funding to carry our local mapping within this financial year.

### 6.1 Timeline to December 2013

The timeline below sets out the main tasks for LLFAs and the Environment Agency between May 2012 and December 2013 to enable us to create the updated Flood Map for Surface Water and meet the requirements of the Regulations for Flood Risk Areas.

Мау	$\cap$	
		Environment Agency - Start carrying out national scale surface water flood mapping for England and Wales, to be completed by Feb 2013.
	N	LLFAs - If you are considering producing mapping within the next 12-18 months, we recommend you carefully consider if there is a real need to do so.
	012	LLFAs outside Flood Risk Areas - We recommend you <u>do not</u> carry out mapping where your sole concern is that the existing national mapping is not representative. The updated FMfSW will improve upon previous national mapping in most locations. We recommend you postpone any decision to carry out new mapping until the national scale mapping is shared by February 2013.
Dec		LLFAs with Flood Risk Areas - We recommend you <u>do not</u> carry out mapping where your sole reason is to meet the requirements of the Regulations. The updated FMfSW will produce mapping that will be suitable for this purpose.
		LLFAs with Flood Risk Areas - National scale mapping will be available from December 2012.
Feb		LLFAs outside Flood Risk Areas - National scale mapping for the remainder of England and Wales will be available by end of February 2013.
		<b>LLFAs</b> - Consider the national scale mapping alongside your local information; agree your best and most representative surface water flood information and submit appropriate local data to the Environment Agency by June 2013.
	2013	LLFAs - In light of the national scale surface water flood mapping, you may consider whether you would still like to do any further mapping. We recommend that the outputs are compatible with the national scale mapping and follow the guidance here.
June		LLFAs and Environment Agency - Tool available to store and share surface water flood risk information.
		LLFAs and Environment Agency - Combine local and national datasets to form updated national scale surface water flood map.
Dec		Environment Agency - In accordance with the requirements of the Regulations, publish surface water flood maps for Flood Risk Areas on Environment Agency website in December 2013.
	$\bigcirc$	

### 6.2 Consider if there is an urgent need to carry out mapping

If you are considering carrying out some mapping in the next 12 months, we recommend that you carefully consider if there is a need to do so. We recognise that some LLFAs would like to produce local surface water mapping as they consider that the existing national mapping products (Flood Map for Surface Water or Areas Susceptible to Surface Water flood map) are not representative of the level of flood risk in their area.

If your main reason to carry out local mapping is due to shortcomings in the Flood Map for Surface Water or Areas Susceptible to Surface Water flood maps then we recommend you do not commission any new mapping at this stage. If possible, we suggest that you postpone your decision until the updated mapping is shared in early 2013.

The new national mapping will improve upon the Flood Map for Surface Water and Areas Susceptible to Surface Water flood maps for the majority of England and Wales. We recommend that you consider whether the new mapping is sufficient and adequately represents the risk in your area before considering whether it is worthwhile and cost effective to produce any new mapping in the next 12 months.

# 6.3 Examples of how some LLFAs have assessed local needs

The following table gathers together some different views from LLFAs about how they have prioritised carrying out surface water flood mapping in their area.

How did you decide on your best locally agreed surface water information?		
•	Compared local knowledge, historic information, local detailed modelling, with national mapping to see which was more representative.	
•	Consulted with neighbouring LLFAs about which maps best represented surface water flood risk in their areas.	
What factors do you consider when deciding where to do detailed modelling?		
•	Properties, particularly residential, with a history of flooding and or the potential to flood internally or be affected by flood water;	
•	Receptors such as critical services and infrastructure, vulnerable services, people, environment or cultural heritage with a history of flooding or the potential to flood.	
What steps do you take to prioritise which locations you model?		
•	Consult the national mapping and any local data to identify high risk areas at a strategic level;	
•	Prioritise the risk based on the factors outlined above (some LLFAs have developed scoring matrices);	
•	Take account of local surface water network, including culverts, trash screens, and drainage systems to identify priority areas.	

Now look at the <u>flow chart in section 3.1</u> to consider which other sections of the guidance may also be relevant to you.

# 7 LLFAs not carrying out mapping in the near future

We recognise that some LLFAs are not considering carrying out any surface water flood mapping in the next 12 months. There may be several reasons for this including the following:

- you have assessed your local flood risk information and you think that the national mapping products (Flood Map for Surface Water and/or Areas Susceptible to Surface Water Flood maps) are representative of surface water flood risk in your area;
- you have taken an analytical and proactive approach to understanding surface water flood risk in your area, but you are unable to carry out mapping due to lack of resources, time or money;
- you do not have sufficient local historic surface water flood risk information to validate detailed mapping at the moment.

### 7.1 Timeline to December 2013

The timeline below sets out the main tasks for LLFAs and the Environment Agency between May 2012 and December 2013 to enable us to create the updated Flood Map for Surface Water and meet the requirements of the Regulations for Flood Risk Areas.

Мау	$\bigcap$	
	20	Environment Agency - Start carrying out national scale surface water flood mapping for England and Wales, to be completed by Feb 2013.
Dec	12	<b>LLFAs</b> - We recommend that you continue to gather local flood information on historic and new flood events - for example, flood reports and maps, photographs, newspaper reports, anecdotal information to help you validate the national scale mapping when it is shared by Feb 2013.
		LLFAs with Flood Risk Areas - National scale mapping will be available from December 2012.
Feb		<b>LLFAs outside Flood Risk Areas</b> - National scale mapping for the remainder of England and Wales will be available by end of February 2013.
		<b>LLFAs</b> - Consider the national scale mapping alongside your local information; agree your best and most representative surface water flood information and submit appropriate local data to the Environment Agency by June 2013.
	2013	LLFAs - In light of the national scale surface water flood mapping, you may consider whether you would still like to do any further mapping. We recommend that the outputs are compatible with the national scale mapping and follow the guidance here.
June		LLFAs and Environment Agency - Tool available to store and share surface water flood risk information.
		LLFAs and Environment Agency - Combine local and national datasets to form updated national scale surface water flood map.
Dec		Environment Agency - In accordance with the requirements of the Regulations, publish surface water flood maps for Flood Risk Areas on Environment Agency website in December 2013.
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### 7.2 What to continue to do

We encourage you to continue to gather local information on historic surface water flood events to help you validate the national mapping and to improve your understanding of local surface water flood risk in your area. We recommend you continue to:

- **record local flood data** in the form of photographs, reports, measurements, newspaper articles, anecdotal data from residents, and use it to compare with the most recent surface water flood mapping;
- **compile useful information** on surface water flood risk, for example:
  - o identify drainage system capacity, in particular urban drainage rates;
  - assess how areas respond to rainfall, for example, does the area respond quickly to intense rainfall, or respond gradually after a prolonged period of rainfall.

Once the Environment Agency has shared the new national mapping with you in early 2013, we recommend you:

- use your recorded local flood data to compare against the updated Flood Map for Surface Water maps; note that the Flood Map for Surface Water only represents surface water flooding and does not represent flooding from other mechanisms or sources such as sewer flooding, flooding from ordinary watercourses, groundwater, or flooding from rivers or the sea;
- where you are confident in your **local recorded information**, including local mapping, use it to understand how well the national mapping represents reality
- if you have local mapping, identify **which data is most representative** of the flood risk in your area;
- identify whether **there is an urgent need for** more detailed mapping to support urgent decision making, and only then consider carrying out new mapping.

Now look at the <u>flow chart in section 3.1</u> to consider which other sections of the guidance may also be relevant to you.

### Guidance on how to make mapping compatible with national mapping and compliant with the Regulations

This appendix will be available with the update to the guidance in October 2012.

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### What to consider before submitting your modelling to the EA to be incorporated into the updated Flood Map for Surface Water

This appendix will be available with the update to the guidance in October 2012.

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### How to make your digital mapping into a compatible format to be incorporated into the updated Flood Map for Surface Water

This appendix will be available with the update to the guidance in October 2012.

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How to determine your new locally agreed surface water mapping

This appendix will be available with the update to the guidance in October 2012.

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### Your questions answered

This appendix will be available with the update to the guidance in October 2012.

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