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**Department for Environment, Food and Rural Affairs  
and Environment Agency**

# Flood Risk Management in England

# Summary

**1** Over 5.2 million (one in six) properties in England are at risk of flooding from rivers, the sea, or surface water. Flooding from the sea and rivers occurs when water overtops or breaches river banks and other defences. Flooding from surface water occurs when drainage and the sewerage systems cannot cope with rainfall or run off from roads and other hard surfaces. The annual costs of flood damage in England are estimated to be at least £1.1 billion and this is expected to rise as the risk of flooding increases with climate change.

**2** The Department for Environment, Food and Rural Affairs (the Department) has policy responsibility for flood and coastal risk management. In 2010-11, it spent £664 million and gave 95 per cent of this (£629 million) to the Environment Agency (the Agency). The Agency has operational responsibility for flood risk management. In addition, local authorities spent £101 million supported by formula grant from central government on flood risk management activity.

**3** The Agency estimates that an average annual increase of £20 million needs to be invested in flood defences between 2010 and 2035, to sustain current levels of protection as risk increases due to climate change. If the extra £20 million was invested each year of this spending review period, it would equate to an overall percentage increase of 9 per cent. The Agency's funding over the period from 2011-12 to 2014-15 will actually reduce by 10 per cent compared with the previous four years budget. It is important therefore that risk is identified as accurately as possible, investment in defence targeted appropriately and alternative sources of funding are secured.

**4** In response to the major flooding of 2007, the Department initiated reforms to clarify local responsibilities and reduce risk. These reforms include giving upper-tier local authorities (unitary and county councils) the lead responsibility for managing local risks, encouraging greater local engagement and decision-making on investment and stronger partnership working. In addition to managing risk from rivers and the sea, the Agency has a strategic overview role for all sources of flooding including surface water.

**5** Our 2007 report examined the performance of the Agency and focused on its flood and coastal defence programme. This report considers the progress since then in identifying the risk of flooding, examines how well investment has been targeted at risk, and assesses how well the Department and Agency are supporting and managing reform. It covers England only and does not address flood incident response or coastal erosion.<sup>1</sup>

<sup>1</sup> The Environment Agency paid out £24 million in respect of coastal erosion projects, studies and coastal monitoring in 2011-12.

## Key findings

### Identifying the risk of flooding

**6 The Agency is an international pioneer in developing a national model covering the long-term risk of flooding from rivers and the sea, but work is required to make it more effective.** The purpose of the model is to provide national and regional risk assessment to guide large-scale investment decisions. The Agency considers the model is fit for this purpose. Estimating the magnitude of long-term flood risk can never be an exact science. However, the available evidence for the accuracy of key elements of the model is mixed and the Agency does not routinely analyse the impact that data uncertainties may have on its risk assessment, making it less effective than it could be.

**7 The Agency's national flood risk assessment and its flood map currently do not present consistent information.** The purpose of the flood map is to raise the awareness of flood risk particularly amongst those who live or work in those areas. It is also used by property owners and local authorities for development planning purposes. Unlike the national flood risk assessment, the map does not take into account any flood defences and does not show the distribution of the level of risk within the areas potentially affected. By 2015, the Agency intends to use the national flood risk assessment as the primary method of showing flood risk.

**8 Flood risk management authorities have developed information over the years on a piecemeal basis, with the result that users of this information can find it inaccessible and difficult to understand.** The Agency recognises that flood risk information needs to be brought together and made clearer and simpler. In particular, local authority mapping and modelling of surface and ground water flood risk is far less advanced than the Agency's approach for rivers and the sea. It is not known how the different sources of flood risk combine and interact. The Agency intends to develop a tool that combines information about flood likelihood from all sources by 2013 although this tool will not consider how the different sources of flood risk interact.

**9 England's flood defence infrastructure for smaller rivers and surface water is not fully known and approaches to build up this knowledge are not integrated.** Features such as boundary walls, culverts (tunnels carrying a stream under a road or railway) and embankments help to reduce the likelihood of floods. Knowledge of features that prevent flooding from smaller rivers or from ground and surface water is far less developed than that of features that prevent flooding from main rivers and the sea. From 2011, lead local flood authorities are required to develop registers, detailing the ownership and condition of all features that they deem likely to significantly affect flood risk. It is for each local authority to decide what information to record, including what 'significant' means, and the systems they use to record this data, although the Department and the Agency have provided guidance. Local authorities will also decide how quickly to populate registers. The systems local authorities use may not be compatible with other local or national systems, hampering information-sharing.

## Targeting investment towards risk

**10 Since our last report, the Agency has improved its knowledge of the condition of existing sea and river defences and this has helped effective targeting of maintenance funding on defences classified as high consequence if they fail.** The Agency must continue to invest in its existing flood defences to maintain current levels of protection. It is progressively targeting its limited funding on defences classified as high consequence if they fail based on the potential impact on people and property. In some regions, however, it is finding it more difficult to withdraw funding from the maintenance of low consequence defences because landowners have historically depended on these defences for land drainage purposes. The distribution of maintenance spend within regions is increasingly influenced by maintenance need, however, it also depends on ensuring its workforce can deliver a timely response to flood incidents.

**11 Ninety-eight per cent of the Agency's high consequence flood defences are at or above the target condition.** The Agency uses a systems approach to manage flood risk as a number of flood defence features work in combination; damage to one could have a serious impact on the effectiveness of the entire system. In 2008-09, the Agency started to measure the proportion of individual defence features that are at target condition in high, medium and low-consequence systems. Since it started reporting this measure, the percentage of Agency maintained features in high consequence systems at or above the required condition has improved from 96.4 per cent to 98.2 per cent. In absolute terms, this equates to 577 features that are now below the required condition compared with 1,117 two years previously.

**12 Central government capital investment has been driven by a range of targets including to achieve a high average benefit to cost ratio overall whilst better protecting as many households at risk as possible.** The Agency appraises investment in flood defence schemes by comparing the benefits and costs of the damage prevented. The Agency achieved a positive ratio of 8:1 compared to a target of 5:1. Over the last spending review period, the Agency's investment provided improved protection to 182,000 households against a target set by the Department of 145,000 households.

**13 Reform of the way in which the flood defence programme is funded is intended to allow greater local input and flexibility.** Under the new approach all flood risk management schemes including surface water, which were previously ineligible, will potentially be offered central investment according to the benefits they expect to deliver. Potential grants for projects will be based on the levels of benefits and outcomes that will be delivered rather than some projects being fully-funded or not supported at all. Under this approach, many projects will remain fully-funded by central government. In other cases, projects that attract sufficient local funding, and where the benefits are greater than the costs, will proceed part-funded by the general taxpayer if supported for funding over other projects by both the Agency and the relevant Regional Flood and Coastal Committee.

**14 If central government funding does not increase after 2014-15, maintaining and improving current levels of flood defence will increasingly depend on significant additional funding being secured locally.** During the current spending review period, the Agency has targeted 85 per cent of its investment on priority schemes to ensure current national protection levels continue despite the 10 per cent reduction in its budget. After this period, unless central government funding increases, local public and private bodies will increasingly be called upon to raise the levels of investment locally that the Agency considers necessary in their long-term investment strategy published in 2009.

**15 The prospect of local bodies contributing additional funding is unknown.** While contributions from other sources have tripled from 2008-09 to 2010-11, this has contributed only £13 million compared with overall capital investment of £1.02 billion from central government. The private sector contributed 20 per cent of this external contribution but, under the new funding arrangements, the Department expect the majority of contributions to come from this source. Local authorities we consulted voiced considerable concern about securing sufficient local funds, especially in the current economic climate.

#### Barriers to effective flood risk planning

**16 Legislation has clarified the responsibilities of bodies for local flood risk management, but effective partnership working in practice will be challenging.** County and unitary councils are now required to take the lead in local flood risk management activity. Other bodies with an interest such as district councils, internal drainage boards, water and sewerage companies and the Agency are under a statutory duty to cooperate. Water companies must have regard to local flood risk strategies rather than act consistently with them, which risks undermining the mutual trust required to share data and collaborate effectively. The Department has not yet made it clear how they will influence and monitor the water and sewerage companies' response to their new responsibilities.

**17 Strategic planning on a catchment scale has a relatively weak influence on local flood risk planning.** The Agency has catchment flood management plans in place for all river catchments, setting out a strategic and risk-based approach to investment for the next 50 to 100 years. However, it has made variable progress in developing and agreeing these plans locally. Data on surface and ground water flood risk is weaker than for rivers and the coast reflecting the lack of detailed modelling available for the former sources of flooding. Shoreline Management Plans have generally been regarded as a success. They were developed in partnership by groups made up of maritime councils and the Agency and ownership generally rests with maritime councils.

**18 Regional Flood and Coastal Committees have a fundamental role in bringing national, sub-national and local priorities together.** The Committees bring Agency and local authority representatives together to make the final decisions about national investment in their catchments. Lead local flood authorities make up the majority of members but representation and engagement varies by region. Committee members we consulted told us they would require more robust, objective and consistent information from the Agency to exercise their role effectively. At the time of our visit, it was not clear how Committees will work across neighbouring catchments and shorelines, in particular, where inland rivers and coastal areas meet.

**19 Local decision-making is hampered by the need to cross-refer to different plans that impact on local flood risk management.** We identified 19 separate sets of wider plans and strategies that could impact on planning for risk in each locality. There is considerable overlap in content. The Department expects new local flood risk strategies to provide more coherence, but it will be a considerable challenge for authorities to align plans.

**20 Stopping inappropriate development on the flood-plain is key to risk management but there is uncertainty over how the planning and flood risk management systems will interact in the future.** The Agency has to be consulted by planning authorities. From April 2008 to March 2011, it influenced proposals for 165,000 units, which have been refused permission or modified in some way. The proportion of new development, built on the flood-plain, some 9 per cent, has been static over this period. The proposed new planning framework still requires authorities to prevent inappropriate development but there is local concern over the uncertain planning law status of local, sub-national and national flood risk plans.

## National support and oversight

**21 Local resourcing and capacity are key risks to the effective delivery of flood risk management.** Local authorities are experiencing difficulty in recruiting and retaining appropriately qualified flood risk staff. Of the local authorities we spoke to, only 30 per cent thought they had requisite technical expertise. The Department has provided £1 million capacity funding in 2010-11 and has committed to fund lead local authorities' additional costs in meeting their new responsibilities. Local authorities' dispute some of the Department's assumptions underpinning anticipated costs and the Department has established a joint working group with the Local Government Group to review and monitor these.

**22 To deliver the efficiency savings required as a result of the spending review, the Agency is implementing a change programme.** It is planning for the number of full-time equivalent posts to decrease by 300 by 2014, having already reduced by 500 over the past year. The Agency has identified a number of key risks which include not having the right skills match for future business needs and accepting greater risk and uncertainty in the planning and execution of some activities. It will take time for changes to be embedded and output in some areas may dip for a period. The management of these risks will be crucial if the Agency is to maintain current levels of performance and perform its strategic overview role for all sources of flooding.

**23 Since 2007, the Department has embarked on an ambitious programme of reform.** It has successfully put in place the majority of institutional and legislative changes required to deliver the reforms. However, there is some local uncertainty about key aspects of the reform, including the operation and prioritisation of new funding arrangements, the implementation of sustainable urban drainage systems and the development of asset registers.

**24 The Department is introducing a new funding system and some projects will require local funding, bringing risks that will need to be managed by the Agency, Department and Regional Flood and Coastal Committees.** The new method used for calculating central funding of some projects does not depend on the benefit-cost ratio of the project but depends on the ratio of benefits to central spending. The Department believe that this will be compensated for by an increase in the level of overall investment in flood defences and result in more cost-effective options being developed. Projects with lower benefit-cost ratios that have attracted local funding could displace schemes with higher benefit-cost ratios that have been unable to attract local funding. In the new system it will be important for the Agency and the Regional Flood and Coastal Committees to work closely to ensure that projects enabled solely through contributions do not unjustifiably postpone more beneficial projects.

**25 It is not yet clear how the Department will provide national assurance that lead local flood authorities have appropriate flood risk management arrangements in place.** The Department is considering how to monitor performance of lead local flood authorities at an appropriate level. At the same time, it wants to maintain an emphasis on local accountability for local decisions and minimise the burden of national reporting on local authorities.

## **Conclusion on value for money**

**26** Since our last report the Agency has improved its knowledge of the condition of its flood defences, and targeted investment more effectively. Giving greater responsibility and discretion to local authorities to identify risks, and raise and target funding, brings some significant challenges, outlined in this report, especially during a time of local authority budget cuts and newly devolved responsibilities. If these challenges are not overcome, the Department's reforms will have failed to fulfil their potential to increase levels of investment in flood management and value for money to the taxpayer.

## Recommendations

- a** While the Department has made good progress in implementing the programme of reform, there is still some local uncertainty over how some key measures will be realised. The Department needs to clarify and more effectively communicate the steps needed to address these outstanding areas.
- b** The new delivery arrangements will create tensions between increased local decision-making and the national accountability and performance framework. The Agency should assure itself that local flood risk management arrangements are not undermining strategic approaches to manage risk at the catchment and national scale. In consultation with Ofwat, the Department should assess the effectiveness of the water and sewerage companies' response to their new duties.
- c** The new approach to investing in schemes will lead to a greater number of projects with more than a single funding partner. While the new system introduces incentives on funding partners to keep development costs to a minimum, the Agency should, by April 2012, develop protocols to govern more joint-funded work. These protocols should identify actions needed to sustain the reduction in development costs the Agency has achieved.
- d** The Agency's support to the Regional Flood and Coastal Committees currently varies across the country. Learning from the best performing regions, the Agency should review the quality of the management information it provides to all Committees so decisions taken are robust.
- e** The Agency needs to improve further the verification process of its National Flood Risk Assessment to provide greater confidence in its results. The Agency should introduce procedures by 2015 to systematically test the separate components of its national risk model and define clear performance targets against which their effectiveness can be assessed.
- f** The Agency needs to communicate, to the public and organisations that rely on flood risk information, that there is uncertainty in its longer-term modelling and mapping data so people can make more informed decisions. The Agency should work to develop an approach to communicating this uncertainty to those who use this information.
- g** The Agency needs to develop a plan to improve its understanding of how the different sources of flood risk interact. The Agency plans to develop a tool that will combine information on flood risk from different sources by 2013. It needs to plan how it will use this tool, and other sources of data, to improve its own understanding of the interaction between different sources and support local authorities.