



National Audit Office

Report

by the Comptroller
and Auditor General

Department for Environment, Food & Rural Affairs

Managing flood risk

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Report by the Comptroller and Auditor General

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Comptroller and Auditor General
National Audit Office

18 November 2020

This report evaluates whether government's approach to managing the risks of flooding and coastal erosion is achieving value for money.

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Key facts

5.2m

properties are at risk of flooding

£2.6bn

capital funding for flooding and coastal erosion between 2015-16 and 2020-21

£5.6bn

new capital funding announced for flooding and coastal erosion up to the end of March 2027

- 728** schemes that have provided better protection for homes to date funded by the £2.6 billion programme for 2015–2021
- 242,000** homes better protected since April 2015 by the 728 schemes
- 16** of the 728 schemes account for more than 50% of the homes now better protected
- 52%** of the 728 schemes have been dependent on partnership funding
- £2,753** average capital expenditure since 2015 for each property with an annual likelihood of flooding of at least 1%
- 7%** of partnership funding has come from private contributions since 2015
- 31%** of the proposed actions in the Department for Environment, Food & Rural Affairs' policy statement on future flood risk management do not have a measurable outcome
- 33%** fall in qualified civil engineers in the Environment Agency between 2013 and 2018

Summary

- 1** Flooding and coastal erosion put lives, livelihoods and people's well-being at risk. Flooding can impact on food production and destroy natural habitats. There are different types of flooding: river, coastal, surface water (when rainfall cannot drain away), sewer flooding and groundwater flooding (where the water table level rises above ground).
- 2** The Environment Agency (EA) estimates that 5.2 million homes and businesses in England are at risk of flooding and that around 700 properties are vulnerable to coastal erosion over the next 20 years. In addition, more than two-thirds of properties in England are served by infrastructure sites and networks located in (or dependent on others in) areas at risk of flooding. The Met Office's UK climate projections show more extreme weather events and sea level rises resulting from climate change. This, when combined with increased housing development, will heighten flooding and coastal erosion risks. Government set a target for EA to provide better protection for 300,000 homes through its investment from 2015 to 2021.
- 3** Flood and coastal erosion risks are managed through a number of interventions, ranging from early warning systems to building flood defences, and making homes and infrastructure more resilient to flooding when it happens. Flood defences can include infrastructure such as flood walls or natural flood management measures such as the restoration of floodplains and wetlands. Other important interventions include: ensuring communities can recover quickly following a flood; building more resilient homes and infrastructure; and adapting existing homes and buildings to increase their resilience.
- 4** The Department for Environment, Food & Rural Affairs (Defra) has the policy lead for flooding and coastal erosion. EA is responsible for taking a strategic overview of all sources of flooding and coastal erosion. It also has powers to manage the risk of flooding from main rivers, reservoirs, estuaries and the sea. Lead local flood authorities (unitary authorities or county councils) are responsible for developing and applying a strategy for local flood risk such as from surface run-off and groundwater. Other bodies with responsibility for aspects of managing flood risk include district councils, internal drainage boards, highways authorities and water and sewerage companies.
- 5** Regional flood and coastal committees bring together risk management authorities to ensure plans are in place to manage flood and coastal erosion risks, and that investment decisions optimise value for money.

6 In July 2020, the government issued a ministerial policy statement setting out its priority to create a more resilient nation to meet the challenges of flooding and coastal erosion. This replaced the previous statement, which was published in 2009. Alongside, EA laid its new strategy in Parliament, which was then published in September 2020. It sets out the vision for “a nation ready for, and resilient to, flooding and coastal change – today, tomorrow and to the year 2100”, and supersedes the previous strategy published in 2011.

7 This report evaluates whether government’s approach to managing the risks of flooding and coastal erosion is achieving value for money. The report examines this in three parts:

- Part One covers whether the current risk management arrangements provide strong and effective oversight, challenge and direction.
- Part Two looks at what government has achieved in the period 2015–2021 and the extent to which it has used available funds to reduce flood and coastal erosion risks and measure progress.
- Part Three examines government’s preparedness to manage and reduce flood risk when a new expanded investment programme begins in 2021.

8 The report covers flood risk management in England. It does not cover government’s emergency response to flooding, issues relating to flood insurance, planning regulations or the management of coastal erosion. In addition to this report, we have produced an interactive data visualisation, which presents a range of information on flood risk management in England. Our audit approach is shown in Appendix One and the scope and all methods are described in Appendix Two.

Key findings

How flood risk management is delivered

9 There are gaps in government’s understanding of public spending for flood risk management. Funding for floods comes from many sources, including government grant-in-aid, partnership funding, levy charges and contributions from other government departments. EA captures private and public funding for its own projects and Defra reports on most central government funding. The Ministry of Housing, Communities & Local Government reports on funding and expenditure by local authorities on flood risk management. However, Defra does not assess whether funding to local authorities is adequate to cover the level of flood risk individual authorities face. Local funding for flood risk management is not ring-fenced and Defra does not compare what authorities spend on flood risk management with what was allocated. Without this knowledge, government is unable to assess whether organisations, such as lead local flood authorities, have the resources they need to manage flood risk effectively. Defra has committed to reviewing local government funding to ensure it is fair and matches the needs and resources of local areas, but it has not set a date for this review (paragraphs 1.21 to 1.24 and Figures 4 and 5).

10 Defra does not do enough to challenge EA's approach and performance.

Defra's role is to provide oversight and challenge to EA and it is accountable to Parliament for the successful delivery of the programme. In line with the wider Defra Group target operating model, Defra decided to reduce the scope of its assurance of EA. At quarterly review meetings with Defra, HM Treasury and the Infrastructure Projects Authority, EA presents headline information on overall progress, key issues and risks and progress on its largest 15 schemes. Defra relies on data provided by EA without carrying out any quality assurance and does not produce its own assessment of programme risk separate from EA's. Defra officials attend several of EA's boards and committees, including those which approve projects over a certain value. Defra could use these as opportunities to challenge EA on its progress and performance, but we have seen no evidence of Defra using these meetings in this way (paragraphs 1.10 to 1.12).

11 EA has to rely on a wide range of other bodies to help deliver its strategy but struggles to coordinate their activities.

Responsibility for surface water flooding, which affects more properties than flooding from rivers and the sea, falls to lead local flood authorities but EA struggles to coordinate their activities and cannot compel them to provide information. EA is responsible for 71% of flood defence assets (by length), while third parties own the remaining 29%. EA needs third parties to better protect 102,000 homes to reach its target. It inspects all flood defences on main rivers including those maintained by third parties but cannot always enforce remedial works. Its local area teams are not communicating asset maintenance requirements consistently with third-party owners. Defra says it will start a review by the end of 2021 to ensure that asset owners' responsibilities are clear and that effective powers are in place to ensure that necessary inspection and maintenance is undertaken (paragraphs 1.3, 1.8, 1.9 and 1.14, and Figure 2).

12 Little progress has been made in streamlining local flood and coastal erosion risk management plans.

In our 2014 report, we found there was a profusion of plans that often create duplication or cross administrative boundaries. Some of this complexity was necessary because government aimed to encourage local communities to do more to manage their own flood risk. At the time, both Defra and EA were looking to streamline the number of plans and strategies in place, but little progress has been made since. In 2019, the Committee on Climate Change highlighted the range of plans attempting to tackle different sources of flooding. Defra promises reform of local flood and coastal erosion risk planning so that every area of England will have a more strategic and comprehensive plan, but not until 2026 (paragraphs 1.18 and 1.19).

The 2015–2021 investment programme

13 EA is on track to achieve 300,000 homes better protected by March 2021 within its budget of £2.6 billion. Since 2015, more than 700 new schemes have been introduced, providing better protection for more than 242,000 homes. It has achieved this on budget and is on track to meet a 10% efficiency target for both capital and revenue spend set by HM Treasury. On average, EA has spent £2,753 since 2015 for each property with an annual likelihood of flooding of at least 1% at the start of the investment period. There are wide regional variations. Investment per property at risk in the North East was almost £6,000, more than double the national average and three times more than in the South West. EA told us it applies a system of national prioritisation to fairly distribute its investment around the country. Defra told us that the level of investment in an area depends on the number of potential schemes but we are also concerned that funding may be determined by the availability of contributions from external parties rather than the relative merits of individual schemes (paragraphs 2.4, 2.10 to 2.12, 2.23 and 2.26, and Figures 8 and 15).

14 ‘Homes better protected’ is an easy-to-understand performance measure, but on its own it does not provide a good view of progress in tackling overall flood risk. By providing better protection for 242,000 homes, EA’s investment programme has delivered valuable benefits for people, with flood risk being substantially lower for many thousands of homes in England. However, the homes better protected target also does not provide any indication of what has happened to flood risk for non-residential buildings, agricultural land and other infrastructure. It also does not take account of properties that have become less well protected over the period due to factors such as housing development, climate change and the condition of flood defence assets. EA uses its National Flood Risk Assessment to estimate the number of properties at risk of flooding each year. It estimates that there are 50,000 fewer properties with an annual likelihood of flooding of at least 1% in 2020 compared with 2016. Changes in methodology during the period mean this figure is not wholly reliable and EA does not use it as a measure of its progress, but it provides an indication of the net impact of the programme. More broadly, EA estimated that its programme would reduce flood risk by 5% in the current investment period, but it does not have a comprehensive measure of progress against this (paragraphs 2.4 to 2.8).

15 The need to adhere to strict funding cycles impacts the value for money of the programme. Rigidly applied funding periods can sometimes create risks where there is pressure to spend money or achieve targets by the end of the period. EA generally uses benefit–cost ratios to prioritise schemes but, from February 2018, started to place more focus on the homes better protected target in order to achieve the target by the end of the six-year funding period. EA told us that this change to its operational approach reduced the overall return on investment, although it estimates it will nevertheless achieve an average benefit–cost ratio across the programme of around 8:1. Despite the six-year capital funding settlement, HM Treasury expects the Defra Group as a whole to work within annual budgets, which reduces EA’s flexibility in managing the programme. HM Treasury told us there is an option to request approval from HM Treasury for transfers between years, but this has not been requested for the 2015–2021 programme (paragraphs 2.6 and 2.16).

16 The winter floods of 2019-20 were a significant setback for EA, leaving thousands more properties at risk. The number of properties at risk as a result of the condition of EA structures and defences increased by 171% from 70,000 in 2018-19 to 189,000 in 2019-20 against a target of 49,000. In 2019-20, EA reported that 96.1% of its high-consequence assets (where asset failure would have a high impact on homes and businesses) were at their required condition against a target of 98%. EA has only met this target in two of the past six years. Floods in 2013-14 and 2015-16 also saw asset condition fall below target levels, which EA recovered in the following years, although the number of properties at risk due to the condition of EA defences was substantially lower at that time than in 2019-20. In the March 2020 budget, government provided additional funding of £120 million for 2020-21 to repair assets damaged in the autumn and winter floods. This is expected to deliver improvements to 610 projects across the country returning assets to their required condition. Of these, 151 have been completed so far, and 80% are expected to be completed by the end of 2020. For the remainder, EA is aiming to have measures in place to mitigate any immediate risks arising from potential floods in winter 2020-21 (paragraphs 2.15 and Figure 11).

17 The government's approach is designed to ensure deprived areas do not miss out on funding, but the proportion of funding to these areas has reduced substantially since 2014. In a recently published report, EA reported that people in more deprived areas were at a higher risk of flooding than others, particularly in coastal and rural areas, although the disparity has narrowed since 2006, when a similar analysis was conducted. From 2011, government introduced a partnership funding model, requiring many flood schemes to be part-funded from sources other than government grant-in-aid. Government provides grant-in-aid on the basis of expected outcomes, such as homes better protected, and these are funded at higher rates in deprived areas than elsewhere so that schemes in these areas are more likely to be fully funded by central government. Neither EA nor Defra monitors the level of investment in deprived areas routinely but EA reports that the proportion of all homes better protected that were in the 20% most deprived areas increased from 4% in 2011 to 29% in 2014 but then declined to 8% in 2019. Defra believes this decline to be because most of the available schemes in deprived areas have been completed, although it has not carried out any analysis to support this explanation (paragraphs 2.17, 2.21 and 2.22, and Figure 14).

18 EA has been successful in securing partnership funding, but this is almost all from the public sector. Just over half (52%) of the 728 projects that had better protected homes between April 2015 and March 2020 had been dependent on partnership funding, where local communities raise funding towards a scheme. EA estimates that it has attracted £530 million of partnership funding in the period 2015–2021, exceeding its target of £390 million and adding 20% to the total government investment during the period. However, more than 90% of this came from local authorities and other public sector bodies, with only £39 million (7%) from the private sector. This is even lower than when we last reported in 2014 when we found that, between April 2011 and March 2015, 25% of partnership funding had been secured from the private sector (paragraph 2.19).

Managing future flood and coastal erosion risk

19 The government's new policy statement and EA's strategy are a significant step forward, but lack clarity in important areas. The previous policy statement (2009) and strategy (2011) were narrowly focused on project appraisal and developing the organisational structures for flood risk management, but the government has now set out a long-term vision to create a nation more resilient to flood risk. Many of the actions in the government's policy statement are not time-limited or measurable, and some important commitments are not expected to be implemented until well into the future. Neither the policy statement nor the strategy quantifies the level of resilience or risk reduction the government expects to achieve. Responses to EA's consultation on its draft strategy indicated broad support for its objectives: almost three-quarters (74%) of respondents agreed with EA's strategic vision (paragraphs 3.2 to 3.7).

20 Government has substantially increased its future capital investment in flood and coastal defences, but will rely on other uncertain sources of funding to meet its long-term aims. In March 2020, government announced grant-in-aid capital funding to EA of £5.2 billion for the six-year period from April 2021 with £140 million brought forward to 2020-21. This represents a 54% real-terms increase in funding compared with the period 2015-21 and equates to annual average funding of £770 million in real terms. A further £370 million of capital funding over the six-year period has been announced for innovative projects and to accelerate work on projects, taking the total capital funding to just under £5.6 billion. EA's long-term investment scenarios indicate that annual investment from all sources of around £1 billion in real terms is needed, including capital and revenue and investment associated with other risk management authorities. Defra is confident that revenue funding and funding from other sources, including partnership funding, will take total annual investment above £1 billion, but the level of this additional future funding is uncertain (paragraphs 3.11, 3.13 and 3.14).

21 EA estimates that increased investment over the period 2021–2027 will reduce flood risk by up to 11% but has no plans to monitor its progress towards this. EA estimates the investment, including the additional funding from other sources, will better protect 336,000 properties and reduce flood risk by “up to 11%”, but it acknowledges that the model used to calculate risk reduction needs improvement as it is highly sensitive to small changes in the input variables and has not changed over the past six years. Defra plans to set out more detail on what it aims to achieve from the programme and how it will be managed in 2021. It also recognises the need to improve how it monitors progress with an action in its policy statement to develop a national set of indicators by spring 2022, but it has not specified whether this will include a measure of overall risk reduction nor, if it does, how it will calculate what it has achieved (paragraph 3.16).

22 The requirement for revenue funding is likely to increase as assets deteriorate more quickly due to climate change and as capital investment growth results in more assets. Revenue funding is used for activities including ongoing maintenance of flood and coastal defence assets. Research commissioned by EA indicates that the cost for maintenance and repairs could increase by between 20% and 70% a year as a result of climate change (sea level rise and increased storm surges and river flows) over the period to 2050. While some of the increase in capital investment may be used to upgrade existing defences, it will also increase the cost of maintenance as the number of assets increases (paragraphs 3.17 and 3.18).

23 Capacity and skills shortages could impact EA's ability to deliver its investment programme and strategy. EA has skill shortages in a number of areas, including engineering, digital and commercial. The shortage of qualified engineers is a long-standing concern and EA saw a 33% fall in qualified civil engineers between 2013 and 2018. While EA has taken action to address this, it currently estimates the need for around 50 (20%) additional qualified in-house engineers to cover the range of projects in its future investment programme. We also heard of capacity issues across local lead flood authorities (paragraphs 3.20 to 3.25).

Conclusion on value for money

24 Between 2015 and 2021, government will have invested £2.6 billion in flood defences. EA is on track to meet government's aim to better protect 300,000 homes, has secured more than £500 million of partnership funding to supplement the programme and expects to achieve an estimated benefit–cost ratio across the programme of 8:1 over this period. However, Defra's narrow focus on the homes better protected target has not necessarily produced the best return on investment and does not represent the full picture. As we approach the end of the current investment period, government does not have a comprehensive measure to demonstrate whether the overall level of flood risk in England is lower now than it was at the start of the programme.

25 Over the next six-year period starting in April 2021, government's capital investment is set to increase substantially to £5.6 billion, with the aim of providing better protection for 336,000 properties and the expectation that the programme will reduce overall flood risk by up to 11%. While the new policy statement and EA strategy are an important step forward, with the new investment period about to begin, Defra has yet to provide full details of what it aims to achieve from the programme, how the programme will be managed and what indicators it will use to measure progress. Unless it develops these, alongside a more robust measure of its progress in reducing flood risk, Defra will not be able to demonstrate convincingly to Parliament that future investment is achieving value for money.

Recommendations

26 Defra should:

- a** before the start of the new investment period (April 2021), provide a clearer sense of direction to all the bodies involved on what government aims to achieve, and what the measures of success will be;
- b** work with the Ministry of Housing, Communities & Local Government and HM Treasury to develop a clear understanding of whether flood risk management funding for local authorities is adequate to cover the level of flood risk individual authorities face, and report on this each year starting from 2021-22;
- c** by April 2021, review its oversight of the programme to ensure it is making the most of existing opportunities to appropriately challenge EA's approach, performance and investment decisions and that it has its own assessment of programme risks;
- d** ensure, when developing its national set of indicators to track progress, that the indicators are clearly linked to the actions set out in its policy statement and that, where possible, its policy statement actions are measurable and time-limited;

- e** work with EA to understand what is driving the profile of investment in deprived areas and whether there are any underlying structural issues behind the decline in investment since 2014; and
 - f** work with EA and HM Treasury to ensure funding cycles do not have an adverse impact on EA's ability to manage their investment programme and optimise value for money.
- 27** EA should:
- g** update and improve its methodology for calculating the risk reduction achieved from its investment programme and, for each year of the new programme, report publicly on annual progress towards reducing risk by 11%;
 - h** as part of its annual reporting, report on the geographical distribution of investment, including the impact of changes to the partnership funding model and the amount of investment directed to deprived areas, to provide evidence to Defra to help inform policy decisions and government priorities; and
 - i** by April 2021, review and update the current approach to communicating with third-party asset owners, develop supporting tools and a communication plan for EA's local area teams to work with third-party asset owners to ensure asset owners are aware of the condition of their assets and of the need for maintenance where required.

Part One

How flood risk management is delivered

1.1 This part sets out the policy and delivery landscape that governs how flood risk is managed in England. We assess the roles played by the Department for Environment, Food & Rural Affairs (Defra) and the Environment Agency (EA) alongside other bodies involved in flood risk management. It examines how these bodies work together to deliver Defra's policy objectives and sets out where funding for investment in flood risk management comes from.

The scale of the problem

1.2 Climate change poses one of the greatest threats to our environment, economy, health and way of life. The Met Office's UK climate projections show more extreme weather events, including more intense rainfall, and sea level rise resulting from climate change.¹ This, when combined with increased housing development, will increase flooding and coastal erosion risks.

1.3 EA estimates that 5.2 million homes and businesses in England are at risk of flooding (around one in six properties), with numbers rising over future decades. In addition, it estimates that around 700 properties in England are vulnerable to coastal erosion over the next 20 years. More than two-thirds of properties in England are served by infrastructure sites and networks located in (or dependent on others in) areas at risk of flooding. In 2016, government assessed the resilience of key local infrastructure and found that 41% of transport and utility infrastructure is in areas at risk of flooding. Furthermore, more than 55% of water and sewerage pumping stations, 20% of railway lines, 10% of major roads, 28% of gas infrastructure and 14% of electricity sub-stations are in areas at risk of flooding.² Of the 5.2 million properties at risk, 3.2 million are at risk of surface water flooding (when the volume and intensity of rainfall overwhelms local drainage), which is even more than those at risk of flooding from rivers and the sea (2.5 million).

¹ Met Office Hadley Centre, *UK Climate Projections: Headline Findings*, September 2019.

² Environment Agency, *Draft National Flood and Coastal Erosion Risk Management Strategy for England*, May 2019.

Sources of flooding

1.4 There are four main sources of flood risk: rivers, coastal, surface water and groundwater. In 2015, the Committee on Climate Change analysed the most significant sources of current flooding in the UK which contribute to an estimated £1.35 billion of damage each year (**Figure 1**).

Roles and responsibilities

1.5 A number of public sector bodies (**Figure 2** overleaf) are involved in managing flood risk in England, along with the private sector water industry. Where responsibility lies depends on the source of flooding risk; the roles and responsibilities of each of these bodies are set out in the Flood and Water Management Act 2010.³

1.6 Defra has policy responsibility for managing flooding and coastal erosion in England. In July 2020, the government published a new policy statement, to supersede the previous 2009 policy statement.⁴ It set out government's policies and its ambition to "create a nation more resilient to future flood and coastal erosion risk".

Figure 1

Estimated cost of annual damage from flooding sources in the UK

Flooding is estimated to cause damage of £1.35 billion a year on average

Flooding source	Estimated cost of damage (£m)	Percentage of total cost (%)
River	560	40
Coastal	320	24
Surface water	260	20
Ground water	210	16
Total	1,350	100

Notes

- 1 The estimated yearly average cost of floods takes into account the possible damage from different-sized events and how often they are expected to occur.
- 2 Surface water flooding occurs when the volume and intensity of rainfall overwhelms local drainage.
- 3 Groundwater flooding occurs when the water level in the rock or soil underground rises and water starts to seep through the surface.

Source: P B Sayers et al., *Climate Change Risk Assessment 2017: Projections of future flood risk in the UK*, Committee on Climate Change, October 2015

³ HM Government, *Flood and Water Management Act 2010*, available at: www.legislation.gov.uk/ukpga/2010/29/contents

⁴ HM Government, *Flood and coastal erosion risk management: Policy Statement*, July 2020.

Figure 2 Public sector bodies with responsibility for managing flood risk in England

Many public sector bodies are involved in managing flood risk in England



○ National □ Local

Notes

- 1 Surface water flooding occurs when the volume and intensity of rainfall overwhelms local drainage.
- 2 Groundwater flooding occurs when the level in the rock or soil underground rises and water starts to seep through the surface.

Source: National Audit Office analysis of Department for Environment, Food & Rural Affairs documents and Local Government Association guidance

1.7 EA is a non-departmental public body with Defra as its sponsoring department. Its board is responsible to government ministers for all aspects of EA's organisation and its performance. It is accountable to Parliament through ministers. EA has three flood risk management roles – strategic, operational and advisory. It has a range of boards and committees that oversee its flood risk management work, including the EA Board and its Audit and Risk Committee.

1.8 Government set a target for EA to provide better protection for 300,000 homes through government's investment from 2015 to 2021. EA is reliant on other bodies to achieve 34% of this target, equating to 102,000 homes. EA is responsible for the condition of 71% of the flood defence assets (by length) in England, with the remainder maintained by third parties such as local authorities and landowners. EA inspects all flood defences on main rivers including those maintained by third parties but cannot always enforce remedial works on third parties. EA's strategy, published in July 2020, sets out its aims to work more closely with other risk management authorities (RMAs) and, by the end of 2021, Defra intends to review the statutory powers to clarify responsibilities and make sure powers are in place for inspecting and maintaining all assets regardless of ownership.

1.9 An EA internal audit report on the maintenance of third-party assets, those that are inspected but not maintained or owned by EA, raised significant concerns about the effectiveness of EA's processes. For example, EA is not consistently informing owners that their assets are below required condition, and that EA is not liable for future asset maintenance.

Defra's oversight of EA

1.10 Defra is accountable to Parliament, including for providing oversight and challenge to EA. While EA has its own governance arrangements which provide Defra with some assurance over EA operations, we have seen limited evidence of additional assurance by Defra. In line with the Defra Group operating model, Defra told us it decided to move beyond the traditional sponsorship model and to reduce the scope of its assurance of EA. The relationship between Defra and EA is defined in a framework agreement that was agreed in August 2017.⁵ A formal review of this agreement should be undertaken every three years, so is now overdue. Defra officials attend several of EA's boards and committees, including the executive directors team and EA's Audit and Risk Committee meetings. However, Defra does not consider its attendance to be a formal arrangement which enables it to use these meetings for assurance purposes.

⁵ Department for Environment, Food & Rural Affairs, *Framework Document: Environment Agency*, August 2017.

1.11 At quarterly review meetings with Defra, HM Treasury and the Infrastructure and Projects Authority, EA presents headline information on overall progress towards the homes better protected target, key issues and risks, and progress on the 15 largest schemes, as well as progress in securing additional funding and in maintaining asset condition. Officials from the Defra Group also attend the EA's Large Projects Review Group whose role is to apply independent scrutiny to business cases for larger or more complex schemes before submission to the Defra Investment Committee. The Group assures and approves schemes valued at £10 million or more, and Defra's Investment Committee and HM Treasury approve those valued at £100 million or more.

1.12 Defra does not have its own independent understanding of the risks associated with the programme but instead relies on the risk register kept by EA. The onus on EA to escalate risks combined with Defra's lack of its own separate risk register means that Defra is not carrying out effective risk management. Defra relies on EA for updates and information on its progress and does not have any information on EA's performance indicators other than what is provided by EA. Defra intends to improve its reporting of progress towards its goals, and to develop a national set of indicators to demonstrate progress, but these will not be in place until spring 2022 and Defra has not specified whether it will include information from sources other than EA.⁶

Regional flood and coastal committees (RFCCs)

1.13 Under the 2010 Act, RFCCs were tasked with bringing together representatives of RMAs at the local and regional level in England. There are 12 RFCCs, with chairs appointed by the Defra Secretary of State. The RFCCs include elected representatives from local authorities in their area, and people of relevant expertise appointed by EA. The performance of RFCC chairs is monitored by EA on behalf of Defra. The RFCCs work closely with the regional area offices of EA. EA must consult the committees about the way in which they propose to carry out their flood risk management functions, including the allocation of grant-in-aid. EA must get the consent of RFCCs before raising a local levy from lead local flood authorities (LLFAs), and before spending the local levy.

6 See footnote 4.

Surface water flooding

1.14 LLFAs are responsible for surface water management. EA lacks powers to compel LLFAs to provide information to EA: while LLFAs must provide data to EA on request, there is no sanction for not doing so, nor any obligation to provide data to an agreed standard. As a result, there are widespread inconsistencies between the methodologies of LLFAs in collating surface water asset registers and investigating and reporting flooding events, and LLFAs do not always have the necessary expertise to map surface water flooding. In July 2018, Defra published a surface water management action plan, which aims to clarify surface water risks and responsibilities and sets out the steps it will take.⁷ This plan includes an action to develop good-practice guidance for LLFAs on keeping and using asset registers. In August 2020, Defra published an independent review by the chair of the Wessex RFCC on surface water flooding. The review contained a similar recommendation on asset registers, suggesting little progress had been made in the intervening two years.

1.15 This same review found that the ownership, maintenance and management of surface water drainage features is highly fragmented between public and private bodies, and responsibilities are “often less than clear cut”.⁸ It found that funding rules need to better recognise the role that water company investment can play in reducing surface water risk, as they are responsible for much of the drainage network. Defra is considering if additional outcome measures are required for water companies ahead of Ofwat’s 2024 price review to address flood and coastal resilience. The fixed regulatory planning system makes this challenging, but Defra told us it is looking at ways to accelerate existing plans and environmental priorities.

1.16 The report by the Committee on Climate Change on government’s progress in preparing for climate change criticised the implementation of Defra’s 2018 Surface Water Management Action Plan, giving it a score of 2 out of 9 which indicates a “low-quality plan with mixed progress in managing risk”.⁹ The Committee’s report cited a focus on data and work practices rather than actions to reduce flood risk, and a lack of explicit consideration of future climate change scenarios. The surface water flooding review, described in paragraph 1.14, also notes EA’s lack of progress on establishing clear responsibilities for the maintenance of assets, by reviewing guidance and engaging in awareness-raising activities with key stakeholders, such as owners of land located on the banks of a natural watercourse.

⁷ Department for Environment, Food & Rural Affairs, *Surface Water Management: an Action Plan*, July 2018.

⁸ Department for Environment, Food & Rural Affairs, *Report of a review of the arrangements for determining responsibility for surface water and drainage assets*, May 2020.

⁹ Committee on Climate Change, *Progress in preparing for climate change*, July 2019.

Local area plans

1.17 LLFAs are required to produce plans setting out how they will address flood risk in their catchment. These plans must identify flood risk which cuts across administrative boundaries, relating to the physical river catchment area.

1.18 In our 2014 report on strategic flood risk management we found there was a profusion of plans that often duplicate or cross geographical or administrative areas.¹⁰ At that time, there were approximately 20 types of strategies, plans and legal frameworks. Some of this complexity was a necessary part of the delivery landscape because government aimed to encourage local communities to take steps to manage their own flood risk. At the time, both Defra and EA were looking to streamline the number of plans and strategies in place. We recommended that Defra and EA should review the range of strategies and plans in place to see if they can be amalgamated or rationalised in order to reduce the burden on communities and promote public engagement. However, there has been no such review or reduction in the number of plans required in the intervening six years. EA told us that the number of plans would need to be looked at as a group, as they fit together as part of an overall framework, and that there would be a role for policy and legislation in doing this. In the meantime, EA has focused on improving planning processes and the alignment between plans.

1.19 In 2019, the Committee on Climate Change further highlighted the range of plans attempting to tackle different sources of flooding.¹¹ In July 2020, Defra committed to reviewing local flood plans with a view to aligning them more effectively with other environmental outcomes, including on water resource management, environmental land management objectives and adaptation to climate change. This new planning landscape is not expected to be in place until 2026, towards the end of the next six-year investment period.¹²

Funding for flood risk management

1.20 Defra Group spending for flood and coastal erosion risk management reached a peak in real terms in 2014-15, the year before the start of the current funding period, when additional funding was made available following the 2013-14 floods (**Figure 3**).

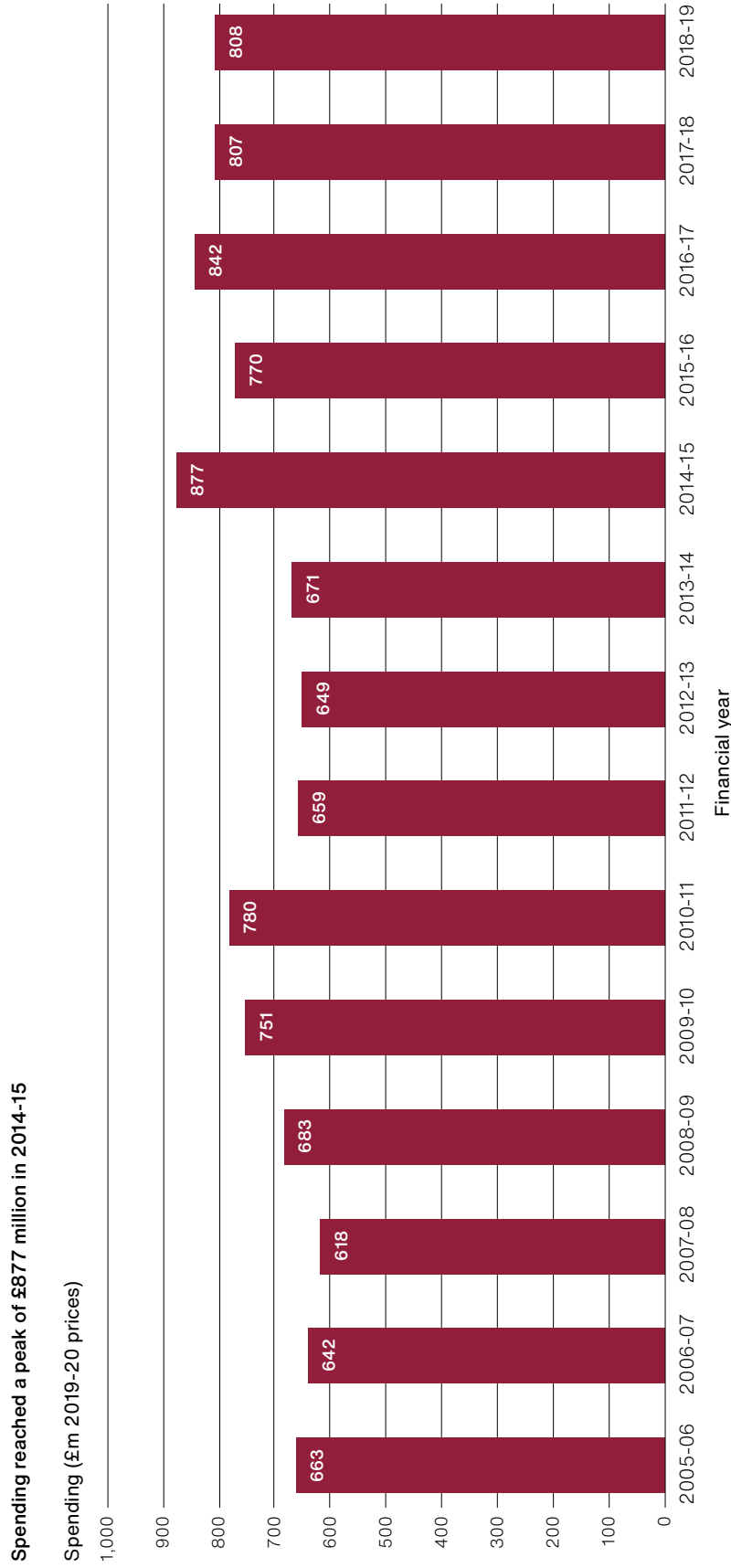
1.21 As well as central government, there are a wide range of other funding sources for flood risk management (**Figure 4** on page 22). Partnership funding is another source of income, where local communities raise funding towards a scheme and either channel it through EA or use it directly, with central government also contributing. Under the partnership funding approach, many schemes can only proceed if funding from local authorities or other partners can be secured.

¹⁰ Comptroller and Auditor General, *Strategic flood risk management*, Session 2014-15, HC 780, National Audit Office, November 2014.

¹¹ See footnote 9.

¹² See footnote 4.

Figure 3
Defra Group spending on flood and coastal erosion risk management in England, 2005-06 to 2018-19

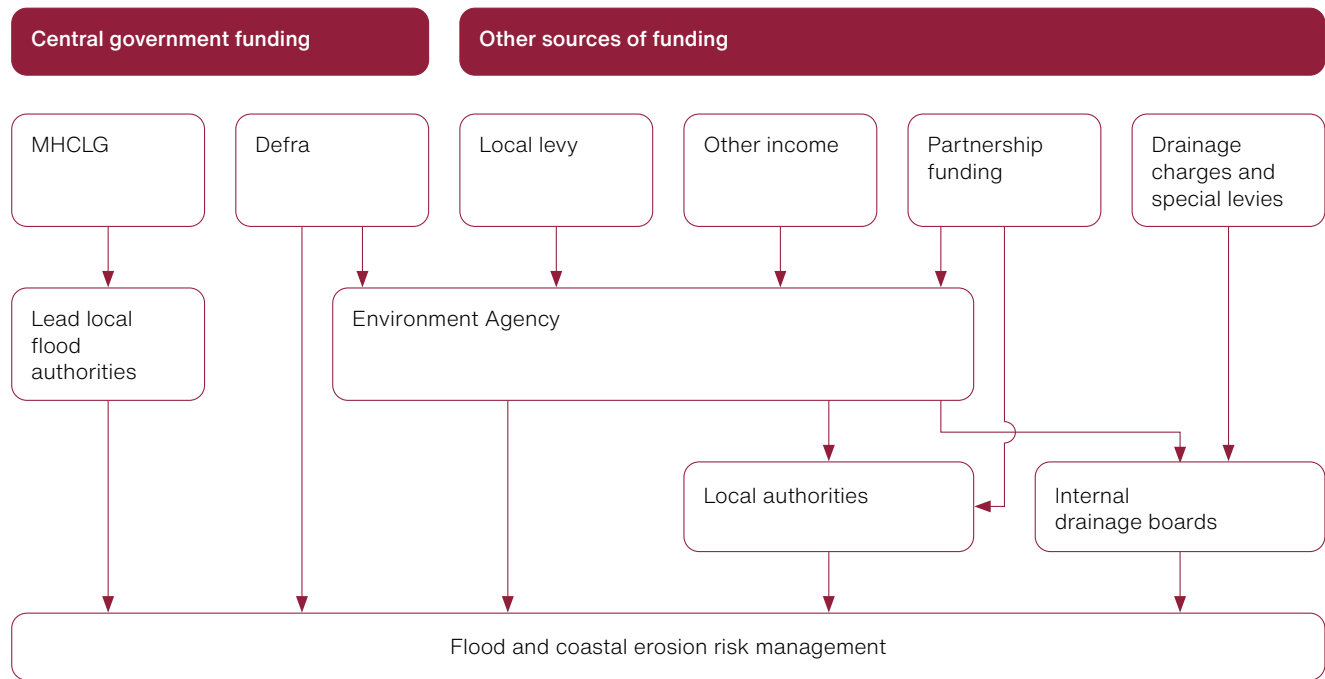


Notes

- 1 Data are for financial year 1 April to 31 March.
- 2 Funding is shown in real terms. Real-terms figures are shown in 2019-20 prices, using HM Treasury's GDP Deflator (June 2019 publication).
- 3 The figures in 2014-15 and 2015-16 include the Repair and Renew Grant scheme, set up following the winter 2013-14 flooding.
- 4 These figures include resource (£32 million in 2018-19) paid by the Ministry of Housing, Communities & Local Government (MHCLG) to local lead flood authorities to support their role under the Flood and Water Management Act 2010. This was paid by the Department for Environment, Food & Rural Affairs (Defra) until 2013, then shared between Defra and MHCLG until 2016, and is now paid in full by MHCLG.
- 5 The Defra Group is the core department plus the 20 bodies that produce joint reports and accounts with core Defra.

Figure 4
Sources of funding for flood risk management in England

There are a wide range of funding sources for flood risk management



Notes

- 1 MHCLG: Ministry of Housing, Communities & Local Government.
- 2 Defra: Department for Environment, Food & Rural Affairs.
- 3 Lead local flood authorities have the main responsibility for reducing the risk of both surface and ground water flooding, along with flooding from ordinary water courses which are not main rivers.
- 4 Internal drainage boards manage water levels in low-lying areas defined as internal drainage districts.
- 5 Local levy: the Environment Agency (EA) generates income through a levy on local authorities.
- 6 Other income: EA also generates income through other sources including internal drainage board precepts, general drainage charges, and the sale of assets.
- 7 Partnership funding: another source of income where local communities raise funding towards a scheme and either channel it through EA or use it directly, with central government also contributing.
- 8 Drainage charges and special levies: internal drainage boards also raise funds from drainage charges and special levies on properties in their areas.

Source: Department for Environment, Food & Rural Affairs, *Central Government Funding for Flood and Coastal Erosion Risk Management in England*, September 2019

1.22 Defra provides grant-in-aid funding for flood risk management to all RMAs, including EA, LLFAs, internal drainage boards, highways authorities and water companies. EA spends its funding directly on managing flood risk, but also passes some on as capital grants for flood defence improvements to local authorities or internal drainage boards. The Ministry of Housing, Communities & Local Government (MHCLG) provides funding for LLFAs but this is not ring-fenced for spending on flood risk management. Defra retains some funding for ad-hoc programmes, such as the Community Pathfinder projects (which funded property-level protection, flood resilience groups and volunteer flood wardens). EA also generates income through a levy on local authorities (the 'local levy') and other sources including internal drainage board precepts, general drainage charges and the sale of assets. Internal drainage boards also raise funds from drainage charges and special levies on properties in their areas. Other government departments provide funding that indirectly contributes to flood risk schemes through, for example, initiatives such as MHCLG's £3.6 billion Towns Fund. All these sources of funding are supplemented by partnership funding.

1.23 EA captures private and public spending for its own projects and Defra reports on most central government spending. MHCLG reports on funding and expenditure by local authorities on flood risk management. However, Defra does not assess whether funding to local authorities is adequate to cover the level of flood risk individual authorities face. Local funding for flood risk management is not ring-fenced and Defra does not compare what authorities spend on flood risk management with what they were allocated. The most comprehensive figures we could identify for the different funding sources are shown in **Figure 5** overleaf.

1.24 The government's policy statement of July 2020 announced that it will consult on changes to the partnership funding policy, but there are no details on when the review will be completed.¹³ In future, Defra expects RMAs to attract more private sector contributions to flood risk schemes. To increase business contributions to partnership funding, Defra intends to review current guidance on corporation tax relief to improve the clarity on where relief is available when contributing to flooding schemes. It also intends to expand and promote the use of local powers through which local authorities can secure additional funding. Furthermore, EA plans to introduce training to help local staff secure additional partnership funding from the private sector.

13 See footnote 4.

Figure 5
Funding in 2018-19 for flood risk management in England

Grant-in-aid was the main source of funding for flood risk management

Source of funding	£ million
Grant-in-aid to the Environment Agency (EA) from the Department for Environment, Food & Rural Affairs (Defra)	667.4
Capital grants awarded to local authorities and internal drainage boards	99.2
Flood risk levies and internal drainage board precepts	48.5
Levies raised by internal drainage boards	33.9
Partnership funding	22.2
EA income from other sources: sale of assets, estates and other miscellaneous income	6.3
Funding retained by Defra for ad-hoc programmes	2.3
Other government departments	Not known
European Agricultural Fund for Rural Development	Not known

Notes

- 1 Data are for the financial year 1 April to 31 March.
- 2 As well as receiving funding from EA, internal drainage boards raise funds from drainage charges and special levies on properties in their areas.
- 3 Other government departments providing funding include Department for Education, Ministry of Housing, Communities & Local Government, and Department for Transport. Defra does not collect funding figures for flood risk management spent by other government departments.
- 4 Flood risk levies are levies on local councils raised in accordance with the Environment Agency (Levies) (England and Wales) Regulations 2011. Available at: www.legislation.gov.uk/uksi/2011/696/made.
- 5 This table is not comprehensive: there may be other funding such as Ofwat funding to water companies.
- 6 Partnership funding excludes funding from local authorities and internal drainage boards which is listed separately.
- 7 Local authorities are able to supplement grant funding with their own resources should they choose to.

Source: National Audit Office analysis of Department for Environment, Food & Rural Affairs and Environment Agency data

Part Two

The 2015–2021 programme

2.1 In this part of the report, we examine what has been achieved over the current investment period, which runs from 2015-16 to 2020-21, and whether government is achieving its objectives. It looks at how investment decisions are reached and the types and geographical distribution of investment.

Aims of the programme

2.2 In 2014, HM Treasury agreed a £2.3 billion capital funding package for government's flood and coastal erosion risk management programme for the six-year period from 2015-16 to 2020-21. Additional funding made available during the period brought the total investment expected during the period to £2.6 billion.¹⁴ The long-term settlement was expected to provide the stability needed to realise significant benefits in terms of efficient delivery and securing contributions from partners.

2.3 Most of the 2015–2021 investment period occurred before the Environment Agency's (EA's) new strategy was published in 2020 and therefore was guided by the previous strategy, published in 2011, which aimed "to ensure the risk of flooding and coastal erosion is properly managed by using the full range of options in a coordinated way".¹⁵ Communities, individuals, voluntary groups and private and public sector organisations would work together to:

- manage the risk to people and their property;
- facilitate decision-making and action at the appropriate level – individual, community, or local authority, river catchment, coastal cell or national; and
- achieve environmental, social and economic benefits, consistent with the principles of sustainable development.

¹⁴ Subsequent to the additional funding that brought the total funding to £2.6 billion, in September 2019, the government announced further funding of £62 million to better protect 9,004 homes. This was in addition to the £2.6 billion funding to better protect 300,000 homes.

¹⁵ The Department for Environment, Food & Rural Affairs and Environment Agency, *Understanding the risks, empowering communities, building resilience*, May 2011.

The ‘homes better protected’ target

2.4 Government measures the success of the current programme principally on a single metric to “better protect 300,000 homes by 2021”, meaning 300,000 homes will be at a lower risk of flooding than they were in 2015. By March 2020, EA reported that the programme had provided better protection for 242,000 homes, and that it is on track to achieve its target by the end of the funding period in March 2021 (**Figure 6**).

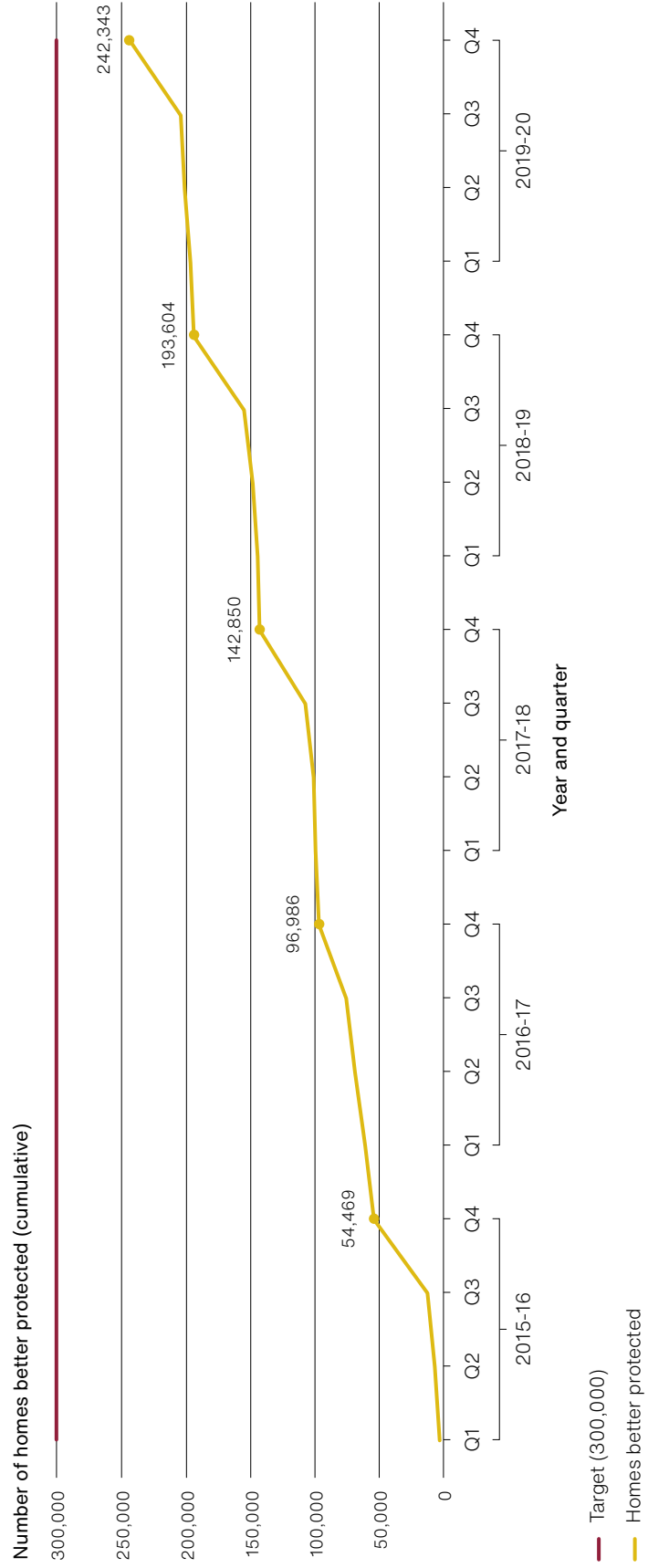
2.5 The target of 300,000 homes better protected is a simple and easy-to-understand metric that provides a strong focus for EA in delivering the programme. However, the target does not take account of wider benefits of the programme, including protection of non-residential buildings, agricultural land, other infrastructure and wider social and community benefits, and so on its own does not provide a good view of progress in tackling overall flood risk.

2.6 EA’s focus on achieving the homes better protected target has reduced its return on investment as it approaches the end of the current investment period. At the start of the programme, EA prioritised allocation of funding on the basis of benefit–cost ratios, including taking account of some wider benefits of the investment and the availability of partnership funding. However, to increase the focus on achieving the homes better protected target, from February 2018 it changed its prioritisation to maximise homes better protected rather than the benefit–cost ratio. EA told us this reduced the overall return on investment, although it estimates it will nevertheless achieve an average benefit–cost ratio across the programme of around 8:1.

2.7 In November 2019, EA’s focus on the target meant that it was mainly focused on the 16-month period leading up to March 2021 to ensure the homes better protected target would be met. As a result, it was funding fewer projects which impacted the programme beyond March 2021, potentially leading to a slow start to the new investment period. To increase the number of projects from 2021, it needed to bring forward funding of £100 million and HM Treasury confirmed this in the March 2020 Budget.

Figure 6
 Number of 'homes better protected' under the flood defence capital investment programme, 2015-16 to 2019-20

Compared with April 2015, 242,000 homes are at a lower risk of flooding



Note

1 'Homes better protected' means homes at a lower risk of flooding than they were in 2015.

Source: National Audit Office analysis of Environment Agency data

2.8 Although EA monitors the number of homes better protected through its programme, it does not have an accurate picture of the overall level of risk reduction the programme is achieving. EA estimated that better protecting 300,000 homes would reduce overall flood risk by 5%, but does not have a comprehensive measure of its progress against this. By providing better protection for 242,000 homes so far, the programme has delivered valuable benefits for people, with flood risk being substantially lower for many thousands of homes in England. However, the headline figure does not take account of properties that have become less well protected over the period due to factors such as housing development, climate change and the condition of existing flood defence assets. EA uses its National Flood Risk Assessment (NaFRA) to estimate the number of properties at risk of flooding each year. It estimates that there are 50,000 fewer properties in 2020 with an annual likelihood of flooding of at least 1% than in 2016. However, because of changes in methodology over the period, EA does not use this as a measure of the net impact of its programmes and a direct comparison between years is subject to some uncertainty.

2.9 The Committee on Climate Change highlighted the limitations of the homes better protected target, stating that there was little published evidence to indicate whether better protecting 300,000 homes in each six-year period would adequately manage the increasing flood risk from climate change and other factors.¹⁶

How the money has been invested

2.10 The 2015–2021 programme has funded more than 1,300 schemes. Of these, 728 have already provided better protection for homes with the remainder yet to do so. These schemes vary greatly in size and scope. The largest, in terms of the number of homes better protected, is the £42 million ‘Hull Frontage’ scheme. It is expected to improve more than seven kilometres of tidal flood defences along the Humber Estuary frontage and provide better protection for 28,000 homes during the current investment period. It is due for completion by March 2021. Of the 728 schemes, the 16 largest account for more than half of the 242,000 homes better protected so far.

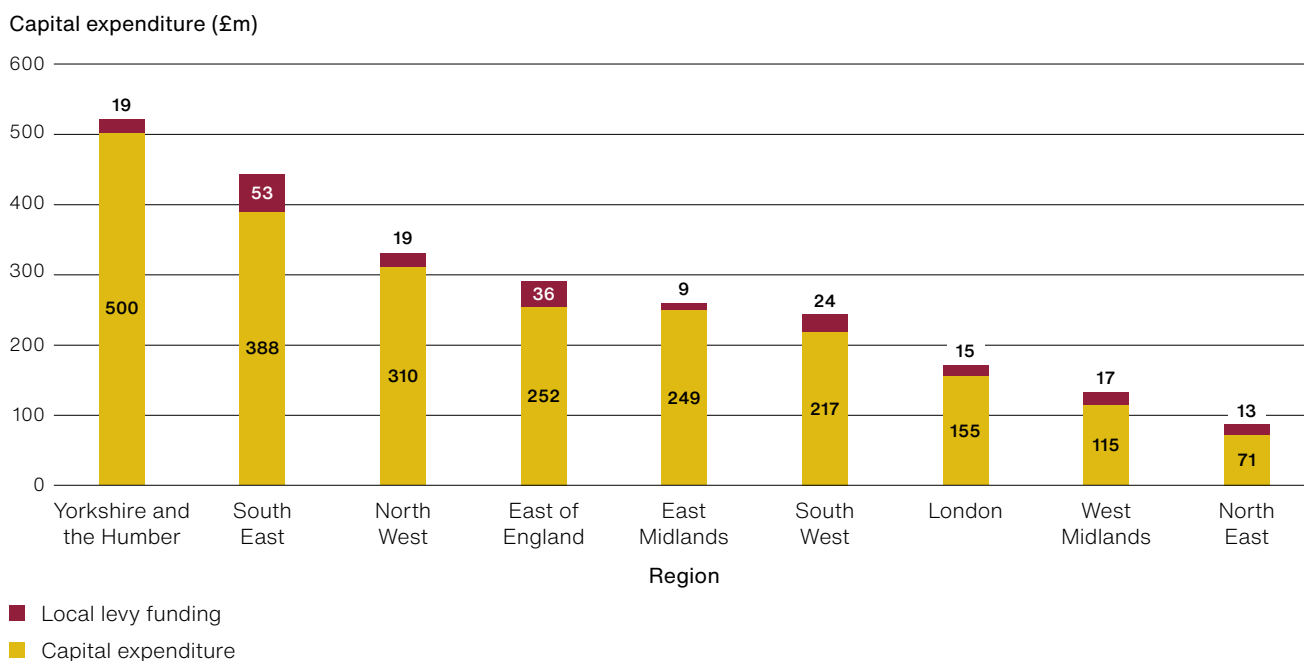
2.11 There are wide regional variations in the amount of investment. Capital spend in Yorkshire and the Humber over the period was £519 million, four times higher than in the West Midlands and six times higher than in the North East (**Figure 7**). The Department for Environment, Food & Rural Affairs (Defra) told us that the level of flood risk drives the level of investment in each region and EA told us it applies a system of national prioritisation to ensure a fair distribution of its investment around the country.

16 Committee on Climate Change, *Progress in preparing for climate change*, July 2019.

Figure 7

Capital expenditure on flood defences, by region in England, 2015-16 to 2020-21

There are wide regional variations in the amount of capital investment



Note

1 The Environment Agency generates income through a levy on local authorities (local levy).

Source: National Audit Office analysis of Environment Agency data

2.12 Even accounting for the level of flood risk in each region, wide regional variations remain. On average, EA has spent £2,753 since 2015 for each property with an annual likelihood of flooding of at least 1% at the start of the investment period.¹⁷ In the North East of England, EA has spent £5,942 per property at risk, more than double the national average and three times that in the South West at £1,937 (**Figure 8** overleaf). Defra told us that the level of investment in an area depends on the number of feasible schemes available, but we are also concerned that funding may be determined by the availability of contributions from external parties rather than the relative merits of individual schemes and this may also have contributed to some of this regional variation. A breakdown by local authority area is shown in **Figure 9** on page 31.

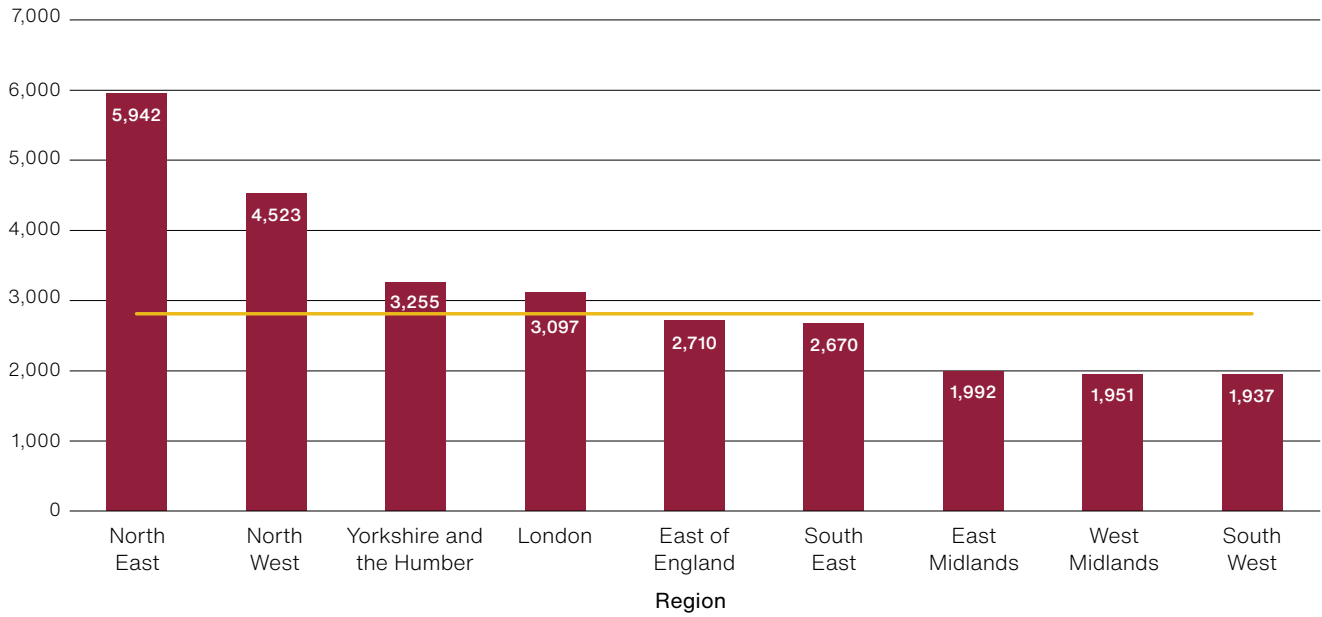
¹⁷ The number of properties at risk is as at 2016.

Figure 8

Average capital spend on flood defences per property with an annual likelihood of flooding of at least 1%, by region, in England 2015-16 to 2020-21

Average capital investment per property at risk varied from £1,937 in the South West of England to £5,942 in the North East

Capital spend per property with at least 1% annual flood risk



— England average: £2,753

Notes

- 1 The number of properties at risk is as at 2016.
- 2 Includes local levy funding. The Environment Agency generates part of its income through a levy on local authorities.

Source: National Audit Office analysis of Environment Agency data

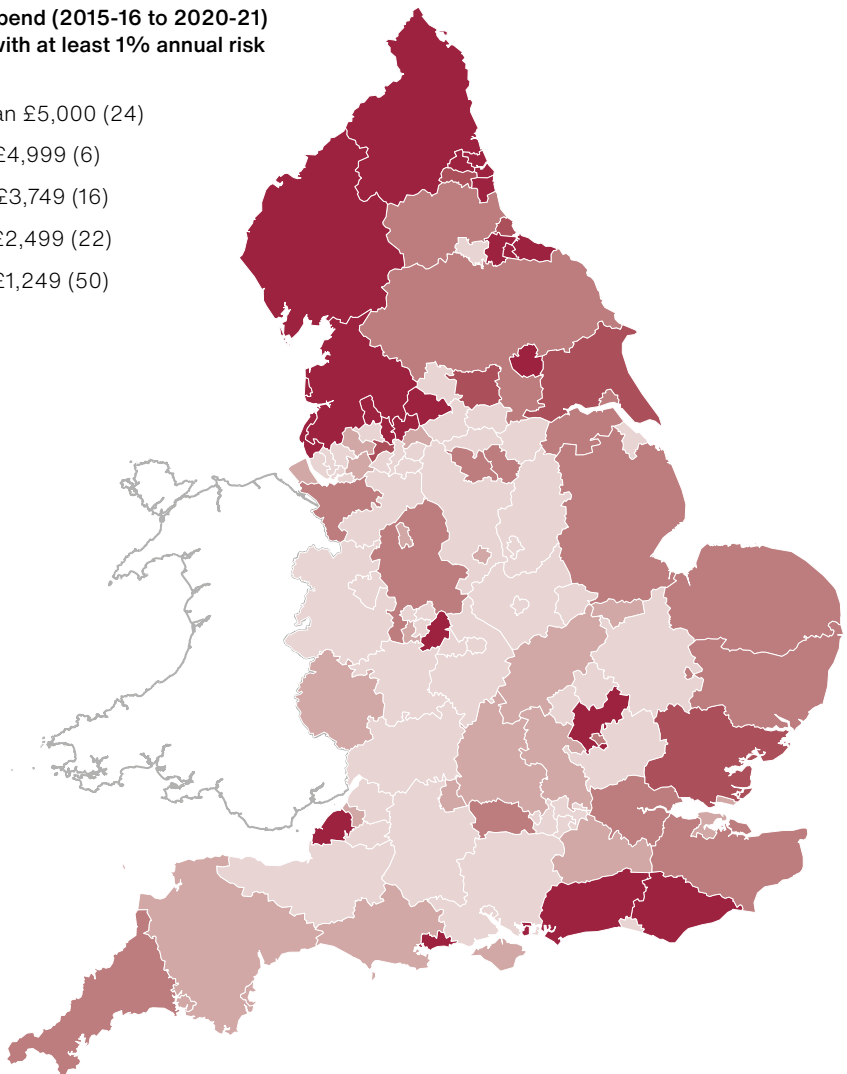
Figure 9

Average capital expenditure on flood defences per property with an annual likelihood of flooding of at least 1%, by local authority, in England 2015-16 to 2020-21

There are wide variations between local authority areas in the average capital investment per property at risk

Total capital spend (2015-16 to 2020-21) per property with at least 1% annual risk of flooding

- Greater than £5,000 (24)
- £3,750 to £4,999 (6)
- £2,500 to £3,749 (16)
- £1,250 to £2,499 (22)
- Less than £1,249 (50)



Notes

- 1 The number of properties at risk is as at 2016.
- 2 Includes local levy funding. The Environment Agency (EA) generates part of its income through a levy on local authorities.
- 3 The median spend per property at risk was £1,864 across local authorities in England 2015-16–2020-21.
- 4 The numbers in brackets shown in the key refer to the number of local authorities within each level of capital spend.

Source: National Audit Office analysis of Environment Agency data

2.13 The majority (67%) of capital expenditure over the current investment period has been spent on construction of new or improved infrastructure, with 33% on inland, river and reservoir defences and 30% on coastal defences, with only a small amount on surface and groundwater (4%). The amount of new construction has increased over the course of the six years, with spend on building inland defences doubling from £84 million in 2015-16 to £167 million in 2020-21. Capital expenditure on maintenance of inland defences, which represents 15% of capital expenditure over the period, has more than doubled from £33 million in 2015-16 to £70 million in 2020-21 (**Figure 10**).

2.14 EA has an asset management strategy which runs from 2017 to 2022. One key objective of the strategy was to achieve ISO55001 (International Standard for Asset Management) accreditation, which it did in 2018. Its 2018 maintenance review gave it a better understanding of the optimum level of maintenance work to deliver the minimum whole-life cost of assets.

2.15 In 2018-19, EA reported that 97.9% of its high-consequence assets were at their required condition against a target of 98%.¹⁸ However, the winter floods of 2019-20 were a significant setback and, in 2019-20, EA's performance on this measure fell to 96.1%. The number of properties at risk as a result of the condition of EA structures and defences increased by 171%, from 70,000 in 2018-19 to 189,000 in 2019-20, against a target of 49,000. EA has only met this target in two out of the past six years (**Figure 11** on page 34). Significant floods in 2013-14 and 2015-16 also saw asset condition fall below target levels, which EA recovered in the following years, although the number of properties at risk as a result of the condition of EA assets was substantially lower at that time than in 2019-20. In the March 2020 budget, government provided £120 million of additional funding for 2020-21 to repair assets damaged in the autumn and winter floods (£58 million for capital and £62 million for revenue). EA told us that this is expected to deliver improvements to 610 projects across the country returning assets to their required condition. Of these, 151 have been completed so far, and 80% are expected to be completed by the end of 2020. For the remainder, EA is aiming to have measures in place to mitigate any immediate risks arising from potential floods in winter 2020-21.

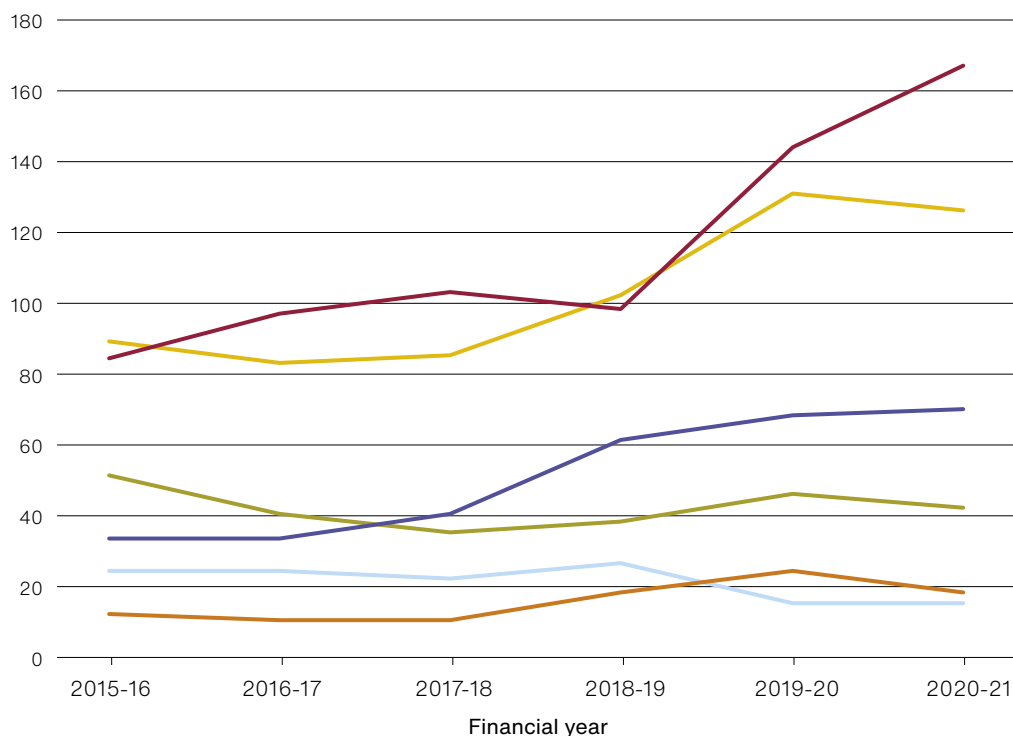
¹⁸ EA sets target condition grades for each of its flood defence assets, from 1 (very good) to 5 (very poor). An asset is considered to be 'Below Required Condition' when it is either two or more condition grades below its target condition or in condition 4 or 5 and below target. A high-consequence asset is one where a failure in the asset would have a high impact on homes and businesses.

Figure 10

Capital expenditure on flood defences in England by type of spend, 2015-16 to 2020-21

Capital expenditure on new and improved flood defences has increased substantially between 2015-16 and 2020-21

Capital expenditure on flood defences in England (£m)



- Construction of new/improved flood defences – inland, river and reservoir
- Construction of new/improved flood defences – coastal
- Construction of new/improved flood defences – surface and groundwater
- Capital maintenance of defences – inland
- Capital maintenance of defences – coastal
- Other

Notes

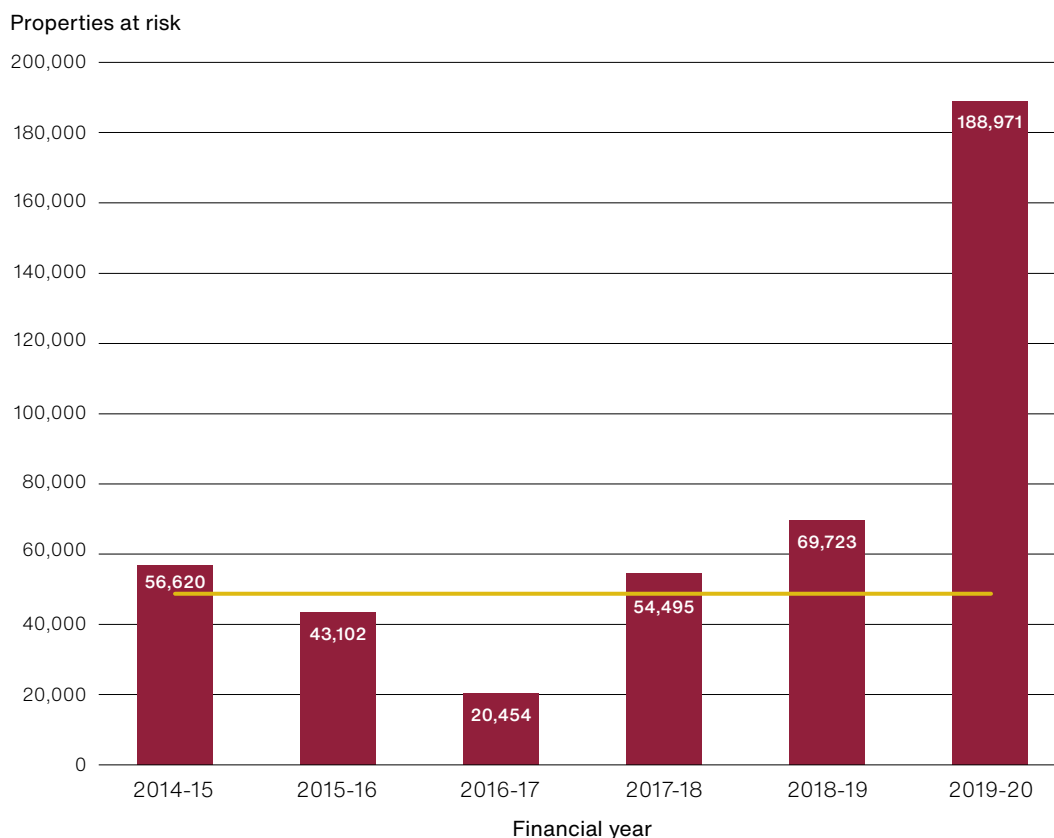
- 1 Data shown in nominal terms.
- 2 Data for 2015-16 and 2016-17 do not include additional funding for recovery from flood incidents – £4 million and £39 million respectively. For 2019-20 and 2020-21, recovery funding is not included – £12 million and £58 million respectively. In March 2020, government announced capital funding for flood and coastal defences of £5.2 billion for the period 2021-22 to 2026-27 with £140 million brought forward to 2020-21. The £140 million is not included in the funding for 2020-21.
- 3 Data are for financial year 1 April to 31 March.
- 4 Excludes other capital expenditure supporting delivery such as fleet, IT systems and capital salaries.

Source: National Audit Office analysis of Environment Agency data

Figure 11

Number of properties at risk in England as a result of the Environment Agency's structures and defences being below required condition

The Environment Agency (EA) has met its target in only two of the last six years



- Properties at risk
- Target (49,000)

Notes

- 1 Data are for financial year 1 April to 31 March.
- 2 EA sets target condition grades for each of its flood defence assets, from 1 (very good) to 5 (very poor). An asset is considered to be 'Below Required Condition' when it is either two or more condition grades below its target condition or in condition 4 or 5 and below target. A high-consequence asset is one where a failure in the asset would have a high impact on homes and businesses.

Source: National Audit Office analysis of Environment Agency data

2.16 The longer-term funding agreed with HM Treasury in 2014 was designed to allow EA and other risk management authorities to provide stability and improve efficiency. However, data provided by EA show that there is a consistent peak of projects being completed in the final quarter of each year, suggesting elements of an annual planning cycle remain (**Figure 12** overleaf). Rigidly applied funding periods can sometimes create risks where there is pressure to spend money or achieve targets by the end of the period. EA told us that some of this annual pattern is caused by the need to complete work to beaches outside of the main summer tourist season. However, although EA has an overall six-year capital funding settlement, HM Treasury expects the Defra Group as a whole to work within annual budgets, which reduces EA's flexibility in managing the programme. HM Treasury told us there is an option to request approval from HM Treasury for transfers between years, but this has not been requested for the 2015–2021 programme.

Partnership funding

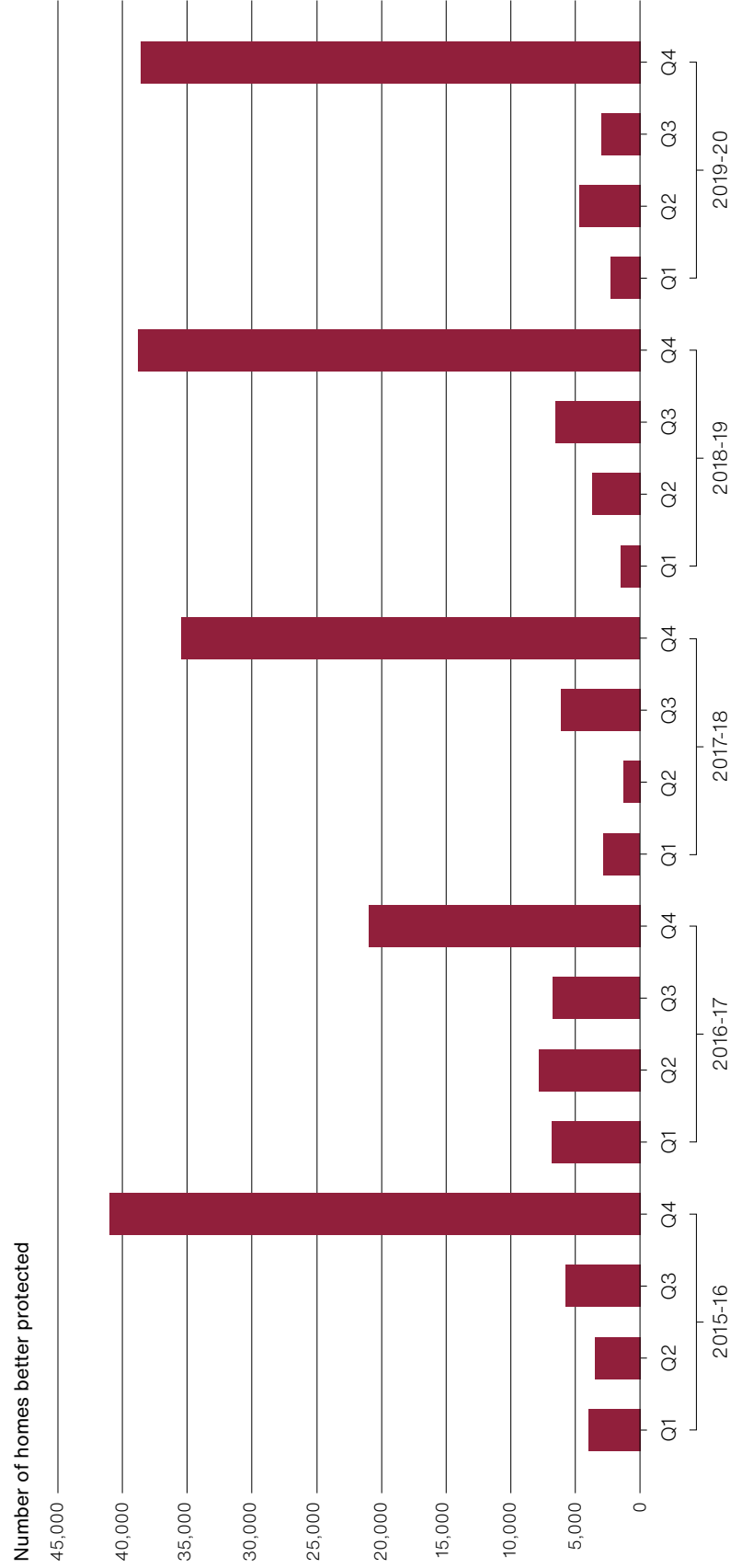
2.17 Government introduced partnership funding from 2011, requiring many flood schemes to be part-funded from sources other than government grant-in-aid. It is designed to ensure that the costs of schemes are shared between national and local sources of funding, to allow more schemes to go ahead and to give communities more of a say in what is done to protect them. It is also designed to ensure deprived areas do not miss out on investment as a result of challenges in securing partnership funding by funding for outcomes, such as homes better protected, at higher rates in deprived areas than elsewhere.

2.18 Defra commissioned an evaluation of the partnership funding model to explore the extent to which it has met its objectives in terms of increasing total investment, enabling local choice and engagement, promoting cost-effective solutions and directing government funding to high risk and other target groups.¹⁹ Following publication of the review in November 2018, Defra announced changes to the scheme in April 2020. Central government funding for a scheme is provided on the basis of the benefits the scheme is expected to deliver with set payment rates for specific benefits. Any shortfall between the total payable for the benefits delivered and the total cost of the scheme must be secured through funding from partners. Although, prior to changes introduced in 2020, the model included an allowance for other benefits such as benefits to businesses, agricultural productivity and protection for national and local infrastructure, across the whole life of the scheme, it favoured residential properties over other buildings. Payments for the protection of businesses, agricultural land, national and local infrastructure, public buildings and sites of cultural heritage are lower than those for protecting households, reflecting the lower proportion of public sector benefits within this category. The changes to the model introduced in 2020 aim to restore the balance between residential and non-residential properties.

¹⁹ Department for Environment, Food & Rural Affairs, *Further evaluation of partnership funding*, November 2018.

Figure 12 Number of homes newly protected each quarter under the ‘homes better protected’ target in England, 2015-16 to 2019-20

There is a consistent peak of homes being newly protected in the final quarter of each year



Notes

- 1 Government measures the success of the current capital investment programme (2015-16 to 2020-21) principally on a single metric to ‘better protect 300,000 homes by 2021’.
- 2 Contributions to the homes better protected target are considered to have been delivered on completion of the works, when the flood or erosion risk is reduced. In some instances, this may be prior to overall completion of the project, for example before completion of surface finishes.

Source: National Audit Office analysis of Environment Agency data

2.19 Of the 728 projects that have better protected homes between April 2015 and March 2020, an estimated 52% have been dependent on partnership funding. EA estimates that the partnership funding model has attracted £530 million of investment into the programme in the period 2015–2021, exceeding its target of £390 million and adding 20% to total government investment during the period. Nearly all the partnership funding has been obtained from public sector sources, with only £39 million (7% of the total) being secured from the private sector. This may be an underestimate as some of the partnership funding obtained through local authorities may include private sector contributions, but EA does not record this. The level of private sector funding is even lower than when we last reported in 2014, when we found that, between April 2011 and March 2015, 25% of partnership funding was secured from the private sector.²⁰

2.20 Some projects are not able to proceed because partnership funding is required but cannot be secured. This could lead to projects with partnership funding going ahead while other projects that offer better value for money do not. There are big regional differences in the amount of partnership funding committed: £112 million has been secured since 2015 for schemes in East of England, compared with only £11 million in London (**Figure 13** overleaf). EA does not keep a record of schemes where partnership funding cannot be secured so it is not possible to ascertain whether these variations are a result of difficulties in obtaining partnership funding for some schemes.

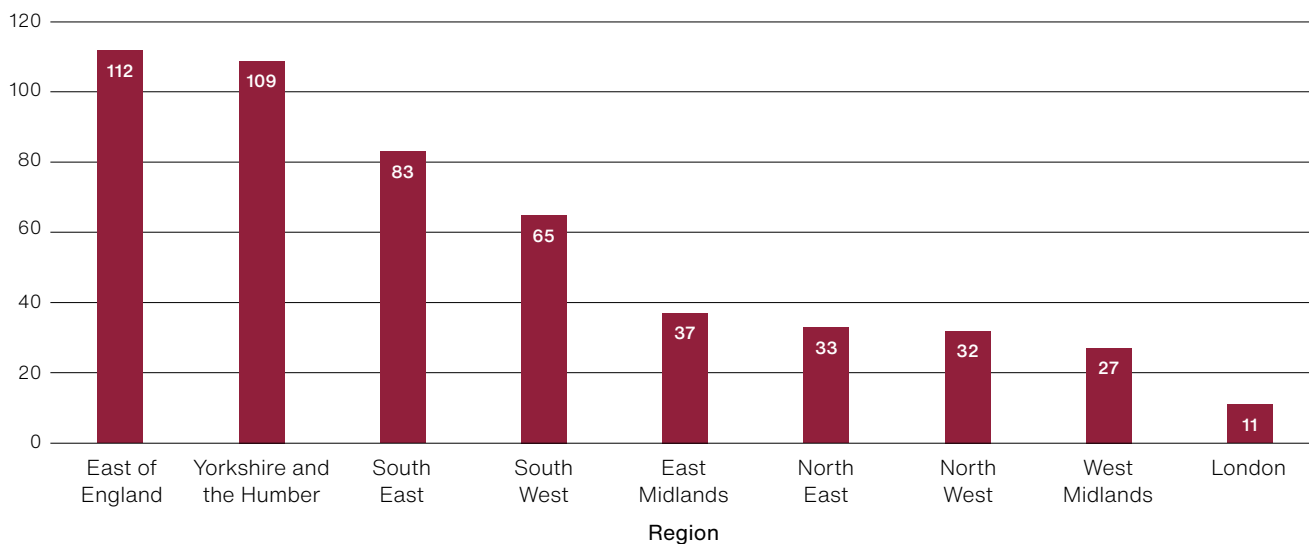
²⁰ Comptroller and Auditor General, *Strategic flood risk management*, Session 2014-15, HC 780, National Audit Office, November 2014.

Figure 13

Total partnership funding from public and private contributions by region, 2015-16 to 2020-21

The amount of partnership funding ranges from £11 million in London to £112 million in East of England

Total public and private contributions between 2015-16 and 2020-21 (£m)



Notes

- 1 Figures include public and private contributions towards Environment Agency and other risk management authority projects and exclude other items such as local levy funding that can be used as a contribution towards projects.
- 2 They include contributions for projects regardless of whether they deliver their benefits within the 2015–2021 programme or beyond.
- 3 Excludes £22 million relating to schemes that cross regional boundaries.

Source: National Audit Office analysis of Environment Agency data

Investment in deprived areas

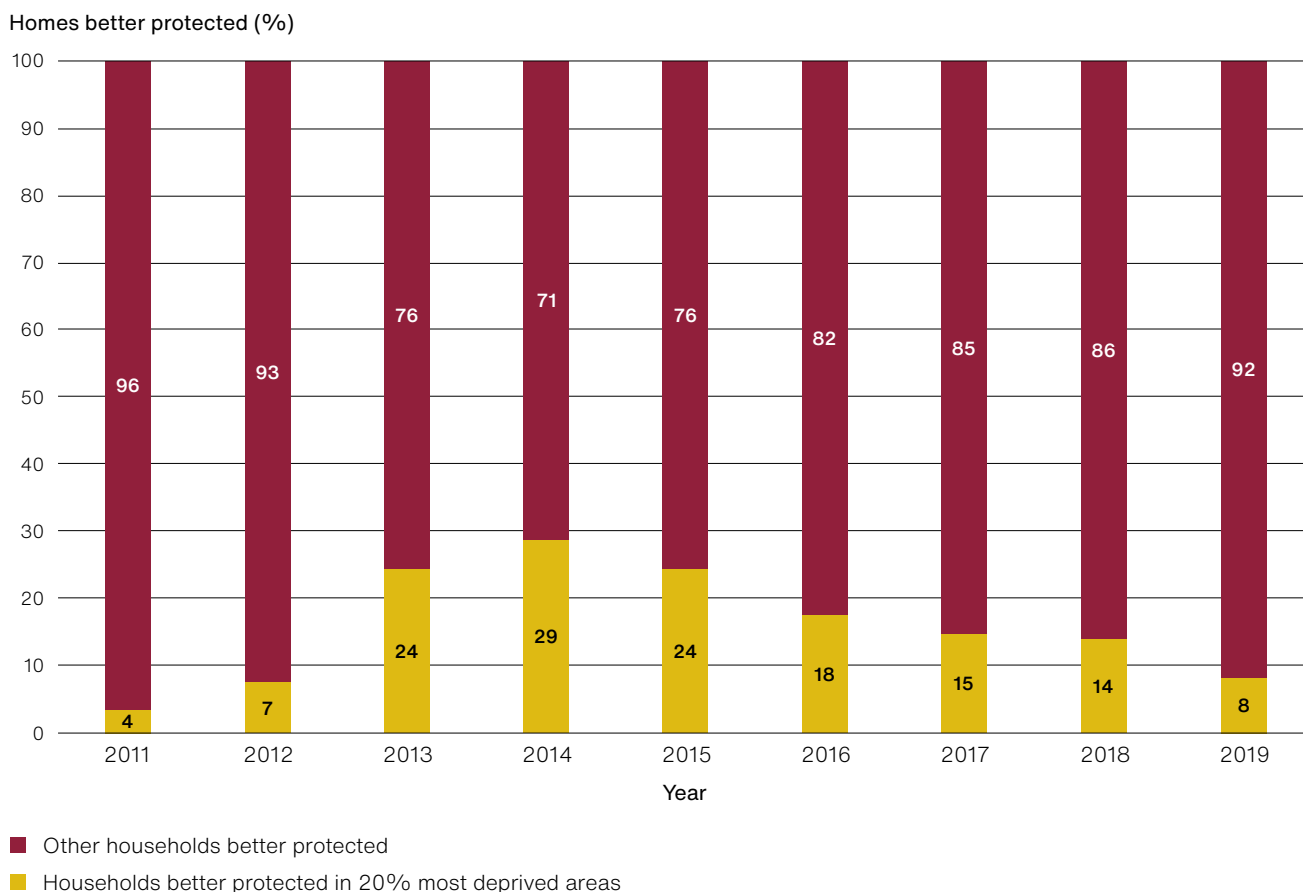
2.21 The amount of investment in deprived areas was one of EA's outcome measures until 2015, but neither Defra nor EA routinely monitors this now. However, a 2020 report by EA found that people from more deprived areas faced greater flood risk than those living in less deprived areas and the disparity is particularly marked in coastal and rural areas.²¹ The report suggests that investment has had a positive impact on social deprivation and inequality in flood risk exposure with the disparity narrowing since 2006, when a similar analysis was conducted. The report also found that the proportion of all homes better protected that were in the 20% most deprived areas increased from 4% in 2011 to 29% in 2014 but then declined to 8% in 2019 (**Figure 14**).

21 Environment Agency, *Social deprivation and the likelihood of flooding*, November 2020.

Figure 14

Homes better protected through investment in flood defences, by deprivation status, in England, 2011–2019

The proportion of all homes better protected in deprived areas as a result of the Environment Agency’s (EA’s) investment has been falling since 2014



Note

1 The measure of deprivation used by EA is the Index of Multiple Deprivation data published by the Department for Communities & Local Government (2015).

Source: Environment Agency, *Social deprivation and the likelihood of flooding*, November 2020

2.22 Defra attributes this increase and subsequent decline to the higher levels of grant payable in deprived areas under the partnership funding approach, introduced in 2011. This meant that more schemes in deprived areas could be implemented without partnership funding. Defra believes that, as a result, schemes in deprived areas with a high return on investment have now been completed, leaving more technically difficult and lower-return schemes to compete with more straightforward schemes in less deprived areas. However, Defra has not carried out any analysis to support this explanation.

Capital programme management

2.23 To date, EA has delivered 586 projects as part of the 2015–2021 programme and overall it is delivering these within its budget of £2.6 billion (**Figure 15**).

2.24 EA has an established project governance structure including a range of boards that oversee its flood risk management work, including the EA Board and its Audit and Risk Committee, and a number of assurance boards. In addition, further assurance is provided through internal audit reports and by the Infrastructure and Projects Authority (IPA). An EA internal audit report (February 2020) found that a clear framework had been established for reporting programme outturn figures, although it found opportunities to improve controls on reporting. Analysis undertaken by IPA found that, while EA's overall programme was broadly on budget, there was significant variation in over- and under-spend across individual projects.

2.25 EA looks to learn lessons from previous projects. For example, its analysis of business case update reports (used to request budget increases) provides EA with a good understanding of the causes of project cost overruns and has resulted in EA making changes to its project assurance processes.

2.26 In the budget settlement for the current capital investment programme, HM Treasury set EA an efficiency target of 10%. In addition, a 10% efficiency target was set for revenue spending in the 2015 Spending Review. To date, EA reports that it has met the annual targets for both capital and revenue and is on track to meet the overall target by March 2021. EA internal audit found the processes for recording savings to be robust and gave them "moderate assurance", although there were opportunities to enhance controls to improve confidence on future project efficiency savings.

Figure 15

Summary of completed 'homes better protected' project costs against budget between April 2015 and September 2020

Completed projects are on budget in overall terms

Component of programme	Number of completed projects	Original approved budget (£m)	Final cost (£m)	Outturn (%)
Other risk management authority (RMA)-led projects	371	394	390	99
Environment Agency (EA)-led projects	215	708	716	101
Total	586	1,102	1,106	100

Notes

- 1 Data incorporate projects completed between April 2015 and September 2020 that have moved through Gateway 4 'readiness for service'. Projects that have not completed Gateway 4 may still contribute to the homes better protected target. Hence the difference between the 586 projects reported in this figure and the 728 projects reported as contributing to the homes better protected target.
- 2 The figure excludes 16 long-term projects which run beyond the investment period and have a forecast budget of approximately £74 million for the period April 2015 to March 2021.
- 3 The original budget of £708 million for EA-led projects includes £39 million for additional scope of work.
- 4 EA carries the risk of project cost overruns on EA-led projects. On RMA-led projects the risk rests with local authorities (LAs). EA pays over an approved capital grant and no more. EA does not know the LA final total cost but does know the outturn of grant-in-aid allocation by EA to the RMAs, which is shown above.

Source: National Audit Office analysis of Environment Agency data

Part Three

Managing future flood risk

3.1 This part examines whether government is putting in place effective plans and strategies to manage future flood and coastal erosion risks. It looks at the Department for Environment, Food & Rural Affairs' (Defra's) policy statement and the Environment Agency's (EA's) strategy, EA's future investment programme and capacity and skills issues for EA and lead local flood authorities (LLFAs).

Defra's policy statement

3.2 The government published its latest policy statement on flood and coastal erosion risk management in July 2020, 18 months later than was planned in the National Adaptation Programme.²² The statement sets out the ambition to create a more resilient nation to meet the challenges of flooding and coastal erosion. This is a step forward from the 2009 policy statement which was focused on the appraisal of flood and coastal erosion risk management.²³ However, it does not quantify the level of resilience or risk reduction it is aiming to achieve. The policy statement acknowledges the need to improve the way in which the full range of actions to better prepare and protect places from flooding and coastal erosion are assessed, individually and in combination. One of Defra's priorities in its single departmental plan is to gather evidence and develop options to inform its future flood and coastal risk management investment programme.

3.3 HM Treasury's *Green Book* states that clear objectives are vital for successful policies, programmes and projects and that objectives should be SMART (specific, measurable, achievable, realistic and time-limited).²⁴ Many of the actions in the policy statement are not SMART. Of the 49 actions, only 15 (31%) are time-limited, with 15 (31%) lacking a measurable outcome. Also, 25 (51%) of the actions referred to further examination, consideration or review rather than setting out a definitive policy action now. For example, Defra's review of local government funding has no date attached and its reform of local flood and coastal erosion risk planning is not expected to be implemented until 2026.

²² HM Government, *Flood and coastal erosion risk management: Policy Statement*, July 2020; Defra, *National Adaptation Programme and the Third Strategy for Climate Adaptation Reporting*, July 2018. The National Adaptation Programme sets the actions that government and others will take to adapt to the challenges of climate change in the UK. It sets out key actions for the next five years.

²³ HM Government, *Appraisal of flood and coastal erosion risk management – A Defra policy statement June 2009*, June 2009.

²⁴ HM Treasury, *The Green Book*, July 2020.

3.4 The National Infrastructure Commission (NIC) provides government with expert advice on major long-term infrastructure challenges. NIC’s first National Infrastructure Assessment recommended a long-term strategy to deliver a nationwide standard of flood resilience so that every community has the same level of resilience.²⁵ At the same time as publishing the policy statement, the Secretary of State for Environment, Food & Rural Affairs wrote to NIC stating that, while Defra agreed on the need for a broad focus on resilience to flooding, it did not agree that standards of resilience was the right approach.²⁶ It stated that there was neither an agreed understanding of flood resilience nor an established method for assessing it, and that developing standards would be a resource-intensive process.

EA’s strategy

3.5 In conjunction with Defra’s policy statement, EA laid its national flood and coastal erosion risk management strategy for England in Parliament in July 2020. This was subsequently published in September 2020.²⁷ It updates the 2011 strategy, which was primarily focused on developing the structures for flood and coastal erosion risk management following the Flood and Water Management Act 2010.²⁸ The strategy provides a long-term vision for how flood and coastal erosion risk should be managed to ensure “a nation ready for, and resilient to, flooding and coastal change – today, tomorrow and to the year 2100”. It is underpinned by two main concepts:

- Adaptive pathways: the approach provides a range of options where future risks are uncertain and can reduce overall costs by improving the timing and effectiveness of investments through, for example, building a flood defence wall that can be upgraded in the future if required. The approach is recommended in the supplementary guidance to HM Treasury’s *Green Book*.
- Moving from protection to resilience: it recognises there needs to be a broader range of actions for achieving climate-resilient places. These include continuing to build and maintain defences, making the best land use and development choices, preparing for and responding effectively to flood incidents and recovering from flooding more quickly.

²⁵ National Infrastructure Commission, *National Infrastructure Assessment 2018*, July 2018.

²⁶ Department for Environment, Food & Rural Affairs, *Flood and coastal erosion: letter from Environment Secretary to National Infrastructure Commission*, 14 July 2020.

²⁷ Environment Agency, *National Flood and Coastal Erosion Risk Management Strategy for England*, September 2020.

²⁸ Department for Environment, Food & Rural Affairs and Environment Agency, *Understanding the risks, empowering communities, building resilience*, May 2011.

3.6 EA undertook a significant consultation exercise to inform its strategy, receiving 400 responses in eight weeks. EA's consultation response document indicates there was broad support for the strategic objectives set out in the draft strategy.²⁹ For example, almost three-quarters (74%) of respondents expressed complete, strong or basic agreement with EA's strategic vision.

3.7 The new strategy is a significant improvement from the 2011 strategy, but there is room to go further. In line with Defra's policy statement, it does not quantify the level of resilience or risk reduction it expects to achieve, although it does set out 20 long-term strategic objectives. All of the 20 strategic objectives in the strategy are time-limited. A number have very long timeframes, such as "between now and 2050", recognising long-term planning and adaptation to climate change. Supporting these objectives are 56 measures, of which 15 relate to ongoing duties and responsibilities of risk management authorities. Of the remaining 41 measures, we found 26 (63%) had a clear time limit. We also found that 31 (55%) of the 56 measures were measurable. In its strategy, EA commits to developing an action plan with partners for taking forward the strategy. This will set interim milestones and targets, and EA intends to publish the action plan by April 2021.

Natural flood management

3.8 There is increasing evidence that natural flood management processes (such as installing leaky wooden dams upstream and restoring natural floodplains downstream) can play an important role in supporting traditional defences to reduce flood and coastal erosion risk. EA's 2011 strategy emphasised the need to ensure that the measures used to manage flood risks work with natural processes, wherever possible.³⁰ In 2017, government announced a £15 million pilot programme to learn more about natural flood management and government's 25-Year Environment Plan committed to making greater use of natural flood management approaches.³¹ However, most natural flood management schemes in England are small-scale. In 2020-21, EA expects to spend just £6 million on natural flood management schemes through the pilot programme, just under 1% of the total capital funding for the year. EA estimates that between March 2015 and April 2021 it will spend £20 million, in addition to the pilot programme, on natural flood management elements of wider flood defence schemes.

29 Environment Agency, *Draft flood and coastal erosion risk management strategy: consultation response document*, September 2020.

30 See footnote 28.

31 Department for Environment, Food & Rural Affairs, *Press release: Schemes across the country to receive £15 million of natural flood management funding*, July 2017; HM Government, *A Green Future: Our 25-Year Plan to Improve the Environment*, January 2018.

3.9 Our analysis of data collected as part of a European Commission-supported project indicates that some European countries (for example, the Netherlands and Switzerland) are investing more on natural flood management and on larger scale projects compared with England. For example, in 2016, the Netherlands implemented a scheme as part of its 'Room for River' national programme, relocating a dyke to reinstate a flood plain at a cost of €351 million and, in 2011, Switzerland completed a €61 million project to restore the Seymaz river to its natural state, which impacted an area of nearly 3,000 hectares.

3.10 Defra is designing the Environmental Land Management (ELM) scheme to replace payments made to farmers and land managers under the EU's Common Agricultural Policy with payments for public goods, such as flood risk reduction and other environmental benefits including payments for natural flood management schemes. The formal ELM pilot phase is due to start towards the end of 2021, with the full scheme introduced in 2024.³²

Investment planning

Long-term planning

3.11 EA uses its long-term investment scenarios (LTIS) to provide a series of economic assessments of future flood and coastal erosion risk management.³³ It models how risk will change due to various drivers (such as climate change) and responses (such as investment in flood defences). Under different climate scenarios, LTIS estimate the optimum level of investment from all sources, if investment is made in all the places where the benefits are greater than the costs. The last LTIS was published in 2014 covering the period to 2065 and was supplemented in 2019 by additional analysis to widen the coverage of scenarios, responses and flood impacts. It found that:

- the optimum level of investment, based on medium and high climate change scenarios, is an annual average of around £1 billion in real terms between now and 2065, which includes capital and revenue and investment associated with other risk management authorities. EA told us that an update with current evidence of climate change and asset deterioration would increase this figure (see paragraph 3.18); and
- this would reduce overall risk (the property damages expected in a typical year) by between 12% (medium climate change scenario) and 4% (high climate change scenario).

³² Department for Environment, Food & Rural Affairs, *Environmental Land Management policy discussion document*, February 2020.

³³ Environment Agency, *Long-term investment scenarios (LTIS) 2019*, May 2019.

3.12 These results are broadly in line with the NIC's estimate of around £1 billion (2018-19 prices) annual average capital investment. The NIC's estimate is lower in early years (£600 million to £700 million from 2020 to 2030) and higher in later years (£1.3 billion from 2035 to 2050).³⁴

EA's 2021–2027 investment programme

3.13 In March 2020, government announced grant-in-aid capital funding for flood and coastal defences of £5.2 billion for the period 2021-22 to 2026-27, with £140 million brought forward to 2020-21. Of this £140 million, £100 million is to increase the number of projects from 2021 (as described in paragraph 2.7), and the remaining £40 million is for work on assets that have struggled to secure partnership funding. This £5.2 billion represents a 72% increase in funding in nominal terms compared with the period 2015-16 to 2020-21, or a 54% increase in real terms. The annual average funding is £843 million in nominal terms (£770 million in 2019-20 prices) (**Figure 16**).³⁵ At the same time, a further £200 million was announced for innovative projects such as sustainable drainage systems and nature-based solutions. In July 2020, a further £170 million of capital funding was announced to accelerate the building of 22 flood schemes, but no annual profile for this funding has been determined. It is not a rolling funding programme as recommended in the NIC's National Infrastructure Assessment and, as discussed in Part Two, could result in a short-term focus on meeting the properties better protected target towards the end of the period, with a potential reduction in the return on investment.

3.14 This level of capital investment is greater than the NIC's estimate for the period 2020 to 2030. It is below EA's LTIS annual average of around £1 billion in real terms, although this includes capital and revenue and investment associated with other risk management authorities. Defra is confident that revenue funding and other sources of funding, including partnership funding and local authority investment, will result in investment levels above EA's estimate of optimal long-term investment. However, the level of revenue funding remains uncertain with the 2020 Spending Review only setting departmental spending limits for one year, 2021-22. Also, the level of partnership funding and additional future funding from risk management authorities has not been determined. As set out in Part Two, EA has exceeded its target for partnership funding for the investment period 2015-16 to 2020-21.

³⁴ See footnote 25.

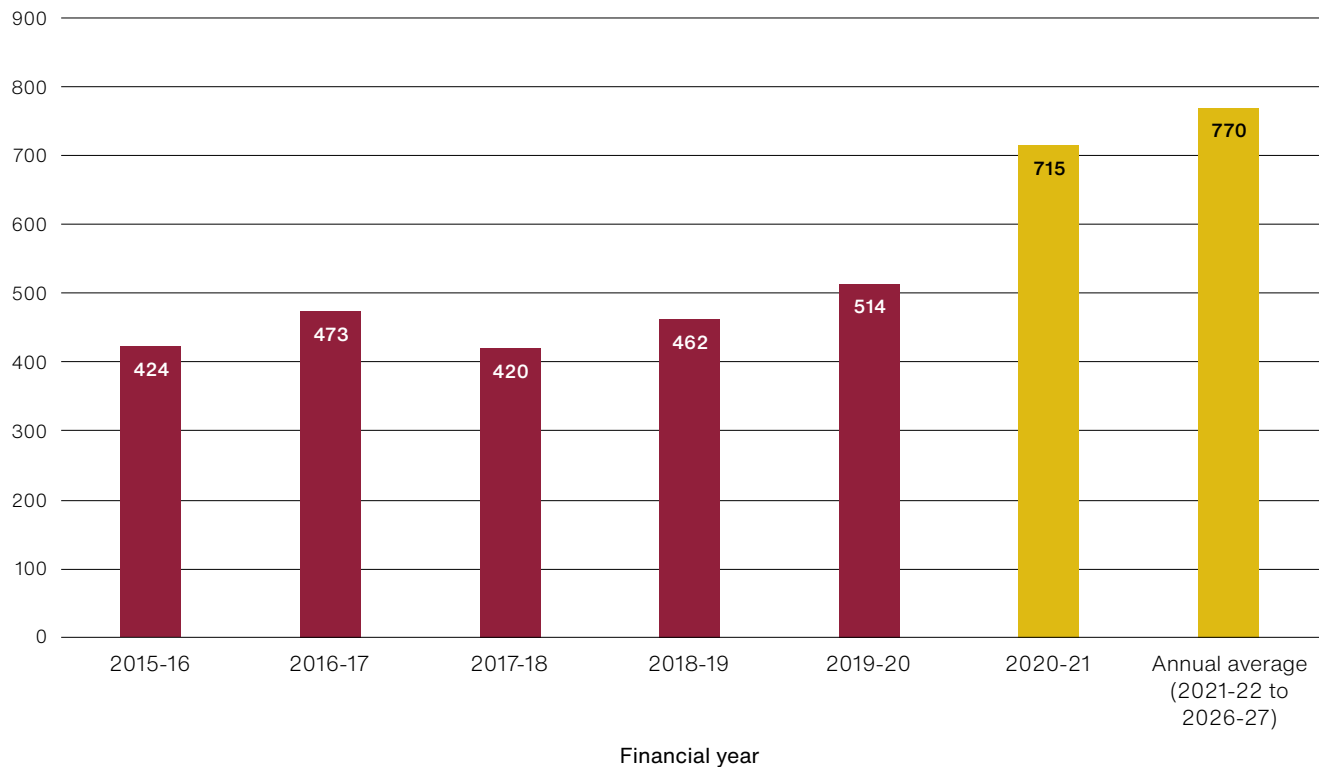
³⁵ The nominal annual funding figures were converted to real terms (2019-20 prices) using HM Treasury's GDP deflator at market prices for June 2020.

Figure 16

Capital funding to the Environment Agency for flood defences in England, 2015-16 to 2026-27

Capital funding will increase substantially from 2021-22

Capital funding (£m)

**Notes**

- 1 Figures are shown in 2019-20 prices (using HM Treasury GDP deflator at market prices, June 2020).
- 2 Data are for financial year 1 April to 31 March.
- 3 The figures for 2020-21 and 2021-22 to 2026-27 are forecasts.
- 4 The figure for 2021-22 to 2026-27 is an annual average.
- 5 Figures for 2019-20 and 2020-21 include capital 'recovery funding' for the repair of damaged assets of £12 million and £58 million respectively.
- 6 In March 2020, government announced capital funding for flood and coastal defences of £5.2 billion for the period 2021-22 to 2026-27 with £140 million brought forward to 2020-21. The figure for 2020-21 includes the £140 million and this is not included in the annual average for 2021-22 to 2026-27. At the same time, a further £200 million was announced for innovative projects such as sustainable drainage systems and nature-based solutions. As no annual profile for this funding has been determined this is not included in the figures above.
- 7 In July 2020, as part of the Department for Environment, Food & Rural Affairs' Policy Statement, government announced a further £170 million of capital funding to accelerate the building of 22 flood schemes. As no annual profile for this funding has been determined this is not included in the figures above.

Source: National Audit Office analysis of Environment Agency data

3.15 EA estimated the partnership funding requirements will be £430 million over the period 2021-22 to 2026-27. Defra announced changes to partnership funding rules (April 2020) which, among other changes, allows a wider set of environmental benefits to be included in project assessments.³⁶ The impact of this will be to reduce the requirement for partnership funding as a proportion of grant-in-aid funding.

3.16 EA estimates the capital investment over the next six years, together with the additional funding from other sources such as partnership funding, will protect 336,000 properties (290,000 homes and 46,000 non-residential properties), reduce overall risk by “up to 11%” and provide a benefit–cost ratio of 5.6 to 1. The number of properties better protected in the programme does not take into account the additional number of properties that will become at risk elsewhere over the period due to factors such as housing development, climate change and the condition of flood defence assets. The risk reduction figure takes account of properties becoming at risk and is compared against a ‘do nothing’ scenario estimated from EA’s LTIS. EA acknowledges that the risk reduction calculation is based on a high-level model and the method of calculation has not been improved over the past six years. It is highly sensitive to the input assumptions. For example, one input variable, the average damage cost per household, was tested with values between £21,260 and £30,000 and was found to affect the change in risk figure by + or – 8 percentage points. Defra recognises the need to improve how it monitors progress with an action in its policy statement to develop a national set of indicators by spring 2022, but has not specified whether this will include a measure of overall risk reduction nor, if it does, how it will monitor this. It will also publish further details of what it expects to achieve from the capital investment over the six-year programme by spring 2021.

Capacity to deliver the investment programme

Revenue funding

3.17 Revenue funding is used for activities including engagement work in advance of capital projects, ongoing maintenance of flood defence assets and incident management. Our 2014 report on strategic flood risk management highlighted the importance of aligning decisions on capital and revenue funding.³⁷ EA highlighted the importance of revenue funding certainty to its ability to plan long term.

³⁶ Department for Environment, Food & Rural Affairs, *Partnership funding*, April 2020.

³⁷ Comptroller and Auditor General, *Strategic flood risk management*, Session 2014-15, HC 780, National Audit Office, November 2014.

3.18 Research commissioned by EA has looked at the impact climate change (sea level rise, increased storm surges and river flows) will have on the deterioration in flood and coastal defence assets and the resultant increased maintenance costs over the period to 2050.³⁸ The research (August 2017) estimates are based on 2015-16 data. When adjusted to current prices and levels of maintenance funding, the increased cost for maintenance and repairs for EA is estimated to be £39 million to £119 million a year depending on climate scenario. This represents an increase of between 20% and 70% compared with the current EA maintenance spend of approximately £173 million. While some of the increase in capital investment may be used to upgrade existing defences, it will also increase maintenance costs as the number of flood and coastal defences increases.

3.19 There has been uncertainty over revenue funding for the next investment period in advance of the 2020 Spending Review. In light of this, EA has taken a cautious approach and scaled back its recruitment and is mainly recruiting temporary staff through its supply chain. The cost of resourcing through the supply chain is higher than the cost of appointing a similar permanent EA appointee, so the overall number of additional staff will be lower.

EA skills

3.20 EA has skills shortages in a number of areas that could impact on its ability to deliver the new investment programme, including engineering, commercial and digital. EA has been concerned about a shortage of engineering skills for some time. Engineers play a business-critical role in the assurance of design, build, maintenance, refurbishment, decommissioning and replacement of flood and coastal assets.

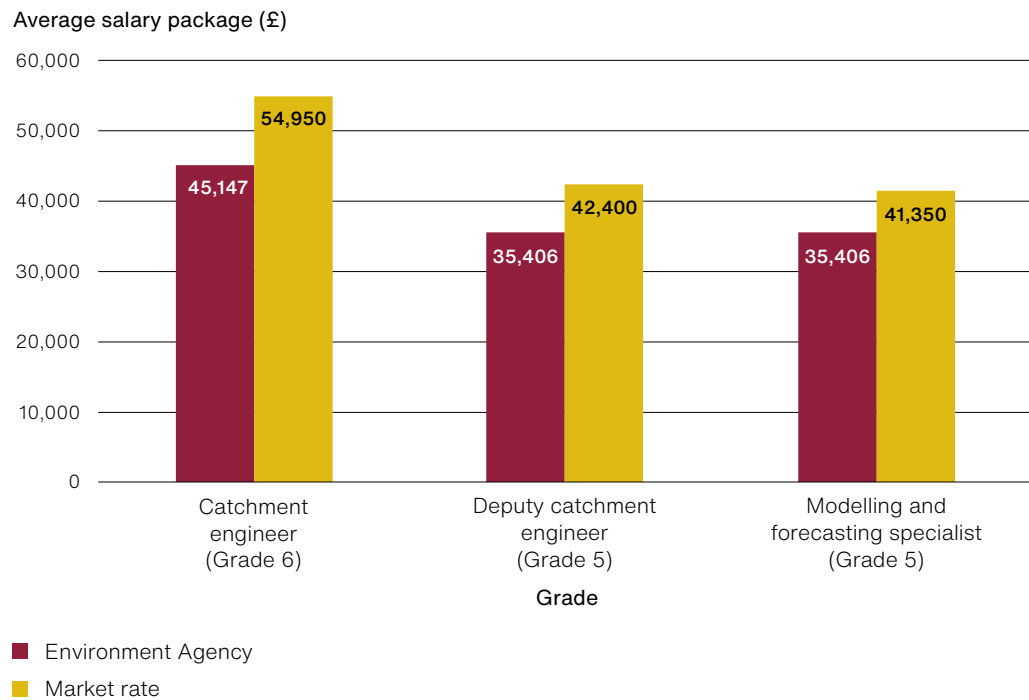
3.21 Between 2013 and 2018, EA saw a 33% reduction in the number of registered civil engineers working in its flood and coastal erosion directorate. A 2019 independent review into the labour market conditions impacting engineers working for EA found that EA salaries are not competitive compared with the open market (**Figure 17** overleaf). EA stated that the current labour market makes it both costly and challenging to recruit suitably qualified and experienced engineers from the open market. This places an additional pressure on EA to develop its in-house engineering skills and capacity.

³⁸ The research forms part of the Flood and Coastal Erosion Risk Management Research and Development Programme funded by the Department for Environment, Food & Rural Affairs, the Environment Agency, Natural Resources Wales and the Welsh Government.

Figure 17

Difference in the salary package of Environment Agency employed engineers compared with the equivalent market rate, by grade

The salaries of Environment Agency engineers is lower than the market rate

**Note**

- 1 Salary package: gross salary (including car allowance, performance bonus and medical insurance) but does not include employer pension contributions.

Source: Arcadis, *Labour market and retention review*, April 2019 (internal Environment Agency report)

3.22 A shortage of engineers is a wider national issue. For example, Engineering UK's report (2018) found that demand for people with engineering skills is not being met by supply through the UK education system.³⁹ EA has taken a number of actions to address engineering skills shortages, for example:

- extending its graduate engineer training scheme;
- uplifting salaries for mechanical, electrical, instrumentation, control and automation engineers, and considering extending this to other engineering roles;
- introducing one-year industry placement opportunities for engineering undergraduate students to work at EA; and
- supporting the Institution of Civil Engineers scholarship scheme which promotes excellence in civil engineering and gives civil engineering students access to placement opportunities.

3.23 Although data on the number of engineers are not consistently recorded over time, EA believes its actions to date have stabilised numbers. It currently employs around 260 qualified engineers and estimates that it will need between 300 and 320 (an increase of approximately 20%) in-house qualified engineers to cover the range of projects in its future investment programme. This will need to be supplemented by contracted engineers through its supply chain.

3.24 Our discussions with EA and its supply chain identified other areas where there are concerns about skills. These include:

- commercial and business awareness both within specialist commercial teams and more generally across EA. EA introduced an Effective Business Engagement training project in 2017;
- digital skills, for example 'building information modelling' (the process of creating and managing digital information about a built asset), which has the potential to significantly reduce maintenance costs through reducing the need for manual inspections;
- community engagement skills, which will increase in importance as the level of investment increases and climate change leads to more difficult decisions about reducing or stopping the maintenance of existing flood and coastal defences; and
- in some areas of EA, project and particularly programme management skills were raised as a specific concern by the two engineering contractors we spoke to.

³⁹ Engineering UK, *Engineering UK 2018: The state of engineering*, 2018.

Lead local flood authority capacity

3.25 We also heard evidence of capacity issues across lead local flood authorities (LLFAs):

- Regional Flood and Coastal Committee chairs told us that LLFAs have significant capacity issues and a need for more revenue funding, and that maintaining ageing assets on current levels of revenue funding was a significant challenge.
- In September 2020, the Local Government Association highlighted to the Environment, Food & Rural Affairs Committee the uncertainty over government's direct funding to LLFAs.
- Our interviews with EA staff also indicated capacity issues. For example, the limited resources available to local authorities to update local surface water flood risk maps. EA told us that it supports and collaborates with LLFAs in areas such as changes to partnership funding, but local authority staff turnover meant skills gaps remain an issue.

3.26 Defra has committed in its policy statement to review local government funding for local statutory flood and coastal erosion functions, although no date is set for this.

Appendix One

Our audit approach

1 This report evaluates whether government's approach to managing the risks of flooding and coastal erosion is achieving value for money. It examines this in three parts:

- Part One covers whether the current risk management arrangements provide strong and effective oversight, challenge and direction, and allow progress to be measured.
- Part Two looks at what has been achieved in the current investment period (2015–2021) and whether government has been successful in maximising the reduction of overall flood risk from the funding available.
- Part Three examines whether government has a credible long-term plan for managing flood risk, what government expects to achieve from the substantially expanded capital investment programme starting in 2021 and government's capacity and capability to deliver its plan and investment programme.

2 We used a range of evaluative questions to assess the value for money of government's approach. These included: whether the current risk management arrangements are ensuring that statutory roles and responsibilities are being undertaken effectively, and whether the Department for Environment, Food & Rural Affairs (Defra) is providing effective oversight; the extent to which government's objectives and targets provide an optimal outcome, and whether the objectives and targets have been achieved within time and budget; the extent to which future plans are credible (have SMART objectives – specific, measurable, achievable, realistic and time-limited) and have the support of stakeholders; if future investment levels are in line with expert opinion; whether there are any capacity constraints that could impact on implementation; and the extent to which specific National Audit Office and Committee of Public Accounts recommendations have been implemented.

3 Because of the potentially wide-ranging scope of the subject, we have specifically excluded certain aspects that might have been expected to be covered. These include the management of coastal erosion, government's emergency response to floods, issues relating to flood insurance and Flood Re (a joint initiative between government and insurers) and planning regulations. It focuses on the Environment Agency (EA) because of its strategic and operational role but recognises that Defra has an important role to play in providing policy lead and oversight, and that local risk management authorities, such as lead local flood authorities, also have an important role to play in managing local flood risk.

4 Our audit approach is summarised in **Figure 18** and our evidence base is described in Appendix Two.

Figure 18

Our audit approach

The objectives of government

The objectives of government's approach have been better defined as a result of a ministerial policy statement published in July 2020 alongside the publication of the Environment Agency's (EA's) new flood and coastal erosion risk management strategy. Part Two of our report examines the current investment period, 2015–2021, which was guided by the previous floods strategy that dated back to 2011.

The new policy statement indicates that the overarching objective is "to create a more resilient nation to meet the challenges of flooding and coastal erosion".

How this will be achieved

Department for Environment, Food & Rural Affairs' (Defra's) policy statement sets out 49 actions that government will undertake to achieve its goal. These are grouped under five headings:

- Upgrading and expanding our national flood defences and infrastructure.
- Managing the flow of water more effectively.
- Harnessing the power of nature to reduce flood and coastal erosion risk and achieve multiple benefits.
- Better preparing our communities.
- Enabling more resilient places through a catchment-based approach.

Our study

We examine whether government's approach to managing the risks of flooding and coastal erosion is achieving value for money in the past, present and future.

Our evaluative criteria

- Do the arrangements in place provide strong and effective oversight, challenge and direction?
- Has government achieved its intended objectives from its investment over the period 2015–2021?
- Does government have a credible plan to protect the country from flooding and coastal erosion in the future?

Our evidence
(see Appendix Two for details)

- We undertook interviews with officials at Defra and EA.
- We consulted with stakeholder groups.
- We reviewed published and internal documents provided by EA and Defra, including policy documents and board minutes and papers.
- We reviewed documents published by other stakeholders.
- We analysed published statistics and unpublished data provided by EA.
- We reviewed evidence from other countries' Supreme Audit Institutions.

Our conclusions

Between 2015 and 2021, government will have invested £2.6 billion in flood defences. EA is on track to meet government's aim to better protect 300,000 homes, has secured more than £500 million of partnership funding to supplement the programme and expects to achieve an estimated benefit–cost ratio across the programme of 8:1 over this period. However, Defra's narrow focus on the homes better protected target has not necessarily produced the best return on investment and does not represent the full picture. As we approach the end of the current investment period, government does not have a comprehensive measure to demonstrate whether the overall level of flood risk in England is lower now than it was at the start of the programme.

Over the next six-year period starting in April 2021, government's capital investment is set to increase substantially to £5.6 billion, with the aim of providing better protection for 336,000 properties and the expectation that the programme will reduce overall flood risk by up to 11%. While the new policy statement and EA strategy are an important step forward, with the new investment period about to begin, Defra has yet to provide full details of what it aims to achieve from the programme, how the programme will be managed and what indicators it will use to measure progress. Unless it develops these, alongside a more robust measure of its progress in reducing flood risk, Defra will not be able to demonstrate convincingly to Parliament that future investment is achieving value for money.

Appendix Two

Our evidence base

1 We reached our independent conclusions on whether the Department for Environment, Food & Rural Affairs (Defra) and the Environment Agency (EA) are responding effectively to the increasing risk of flooding after analysing evidence collected between March and October 2020. Our audit approach is outlined in Appendix One.

2 Due to COVID-19 we were not able to undertake some of our intended fieldwork, including case study visits to flood defence sites and interviews with EA staff in area offices and operational teams.

3 In designing and carrying out our work, we took account of the National Audit Office's previous report on flood risk management and the subsequent Committee of Public Accounts report.^{40,41}

4 In addition to this report, we have produced an interactive data visualisation which presents a range of information on flood risk management in England. The app is accessible here: www.nao.org.uk/other/managing-flood-risk-a-data-visualisation/

5 We interviewed staff from Defra and EA. The people we interviewed at Defra included those responsible for policy and funding of flood and coastal erosion risk management. The staff we interviewed at EA included those responsible for: strategy and national adaptation; funding allocation and programme management; asset management; and skills.

6 We interviewed officials from other parts of government:

- HM Treasury
- Infrastructure and Projects Authority
- Ministry of Housing, Communities & Local Government.

40 Comptroller and Auditor General, *Strategic flood risk management*, Session 2014-15, HC 780, National Audit Office, November 2014.

41 HC Committee of Public Accounts, *Strategic Flood Risk Management*, Forty-eighth Report of Session 2014-15, HC 737, March 2015.

7 We consulted a range of stakeholder groups to get their views on current flood and coastal erosion risk management arrangements and government's plans for the future. The organisations we spoke to were:

- Association of Drainage Authorities
- Department of Geography and Environmental Science, University of Reading
- East Riding of Yorkshire Council
- Environmental Change Institute, University of Oxford
- Kent County Council
- National Farmers Union
- National Flood Forum
- School of Civil Engineering and Geosciences, Newcastle University
- The James Hutton Institute
- Water UK.

8 We held a small focus group with a number of chairs of regional flood and coastal committees. The group covered topics including: the current risk management arrangements; the roles of Defra and EA, and how they work together; Defra's new policy statement and EA's new strategy; and funding and capacity.

9 We interviewed suppliers who work with EA and other risk management authorities through EA's collaborative delivery framework. The interviews covered areas including: how EA's Next Generation Supplier Arrangements are working; their relationship with EA; Defra's new policy statement and EA's new strategy; supply chain capacity; and planning for the next capital investment period. The suppliers we interviewed were:

- JBA Consulting
- Atkins
- VolkerStevin
- One Group Construction.

10 We reviewed published and internal documents from Defra and EA.

We used this information to understand how these bodies: exercise their funding and oversight responsibilities; manage investment programmes; and develop policy and strategy. These documents included material relating to:

- governance and oversight arrangements;
- funding policy and detailed funding arrangements;
- programme targets and performance;
- international collaboration and research projects;
- strategy development and long-term investment planning;
- planning for the next capital investment period; and
- capacity and skills.

11 We reviewed published documents relating to flood risk management by the Committee on Climate Change, the National Infrastructure Commission and other stakeholders.

12 We analysed publicly available and internal data provided by EA. There were some limitations to the data available in areas such as the number of projects not undertaken due to lack of partnership funding. The data analysed included:

- time series data on capital and revenue funding, including sources of funding as a result of the partnership funding model and a breakdown by investment category;
- regional analysis of funding levels in total and per property at risk in each region;
- progress towards the 'homes better protected' target, with data broken down by region and local authority;
- properties at risk data and how these have changed over time, broken down by region and local authority; and
- the level of investment in deprived areas.

13 We reviewed responses to our request for information on international experience of flood risk management arrangements from other countries' Supreme Audit Institutions (SAIs). We received responses from SAIs in:

- France
- The Netherlands
- New Zealand
- Portugal
- Spain
- Switzerland.

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