



National Infrastructure Commission's Call for evidence on Surface Water Flooding Study

Consultation response

December 2021

www.water.org.uk

Introduction

Water UK is the representative body and policy organisation for water and wastewater companies across the UK. Water companies are one of a number of risk management authorities designated in the [Flood and Water Management Act 2010](#) and a Category 2 responder under the [Civil Contingencies Act 2004](#).

Given the geographical scope of the consultation, we are responding on behalf of companies wholly or mainly in England. Please see individual water company responses for additional, company-specific details. We would welcome the opportunity to discuss any part of this response with you in further detail in follow up meetings.

Water UK supports Defra's review of Schedule 3 currently underway, as well as the work of the Storm Overflows Taskforce on potential legislative changes to reduce excessive hydraulic loading to sewers with constrained capacity. We are directly inputting into these workstreams, so do not specifically address those pieces of work in this response.

Summary

There have recently been some important steps forward on surface water flooding – for example, the Environment Act's underpinning of Drainage and Wastewater Management Plans. This innovation was developed by water companies in recognition of the challenges of climate change and the need for a more strategic and collaborative approach. However, despite those steps forward the legislative framework will remain outdated, fragmented and unable to fully support the delivery of integrated surface water management.

The water industry therefore strongly welcomes the NIC's examination of surface water management.

The most important improvement would be a legislative review with the specific aim of achieving better integration of all the flood risk management authorities and their work, together with better clarity and stronger duties to bring leadership to these disparate groups and ensure they act in a coordinated manner for the benefit of customers and society. Similarly, current regulatory frameworks constrain the water industry's ability to manage surface water flood risk in a way that reflects the growing challenges posed by climate change impacts.

Understanding the problem

1. What previous analysis of key surface water flood risks has been undertaken which the Commission should be aware of and could build on?

The management of surface water flood risk is fragmented with several risk management authorities being responsible for differing elements which overlap and are difficult to separate. Collaboration is essential in order to fully understand and manage the risk, but no one body has powers to effectively convene all parties and data. Each body therefore naturally prioritises its own area of responsibility and the strategic oversight and collaboration is usually an add-on, if resources permit. Water companies play their own part in the current system, seeking to collaborate where possible, but would welcome legislative clarity on roles and responsibilities, and changes to provide powers to compel more integrated work and enable all parties to work in the common interest.

Water companies have:

1. Developed wastewater hydraulic models to estimate the percentage of the population at risk of sewer flooding during a 1 in 50 year rainfall event
2. Modelled the risk posed to their own assets by surface water (such as the flooding of a water treatment site)
3. Established a number of dedicated surface water management programmes in place for which they have used a combination of data (hydraulic modelling, historical flooding data, combined sewer overflow records, SuDS Studio Mapping, etc.) to determine areas to prioritise their investment within AMP7

Water companies have fed insight into previous reviews (including Pitt, Jenkins and Schedule 3 reviews). They have also undertaken extensive work around surface water flood risk in preparing for previous business plans and are currently updating this through their work in developing their Drainage and Wastewater Management Plans.

The above approach helps water companies meet their commitments and a similar approach is proposed for PR24.

2. Considering the current responsibilities and approach to quantifying and mapping surface water flood risk, what data is available? What areas need to improve? How can this be achieved?

The roles and responsibilities for surface water management (including data, modelling and mapping) are complex with multiple stakeholders taking different approaches. For example, we are aware of:

- Water company 'wastewater hydraulic models'
- Environment Agency / Natural Resources Wales surface water mapping (acknowledging that surface water doesn't recognise geographical boundaries and cross-border mapping is necessary too)
- Lead Local Flood Authority Surface Water Management Plan models

The result of these differing approaches is an inconsistent national picture that does not represent the true risk. There are a lot of unknowns which further exacerbates the uncertainties in the current data available.

We recommend that:

- A. A central repository be established to help resolve this, so that **all** surface water assets can be appropriately captured and then incorporated within any future updates to surface water modelling for any given area. The current asset register requirement (under the Flood and Water Management Act) does not go far enough, and the uptake of this duty is disjointed, with differing approaches being taken nationally.
- B. The revised duty for a central repository would need to be managed and maintained by a national body (the Environment Agency may be well-placed under their strategic overview role). This would be accompanied by a consistent (and proportionate) approach to the required standards of this information. The national body would also be responsible for ensuring the data is accessible. A standardised approach to data and information-sharing among flood risk management authorities will facilitate better coordination and collaboration for surface water management and it will also assist water companies in the preparation of their Drainage and Wastewater Management Plans.
- C. A duty requiring all risk management authorities and developers to use the repository before undertaking any modelling or work that could alter the risk of surface water flooding. This would encompass a duty to update the repository after any changes have been made (including after undertaking schemes to address other flood risk sources).

Information that should be contained within the repository (including asset condition) includes but is not limited to:

- Private surface water drains and sewers
- Land drains or other riparian pipes and watercourses
- Highway drainage systems and associated structures (including boundary walls and kerbs which may direct overland flow)
- Sustainable Drainage Systems (SuDS) or other underground storage in new/retrofit developments
- Nature-based interventions
- Other undertakers' assets, such as railway trackside drainage and utility ducts, which often act as conduits for excess surface water flows
- Private company or individual property protection measures
- Local knowledge of previous flooding events
- Information on the interrelationship between networks (such as surface water outfalls into watercourses, or overland flows on highway drainage systems)

3. What do you consider to be the key factors contributing to the risk of surface water flooding in urban areas and rural locations? Are there other variations to consider?

Key factors contributing to the risk of surface water flooding (in no particular order) include, but are not limited to:

Ambiguity in roles and responsibilities

- Patchwork of organisations with different and overlapping responsibilities (but still leaves gaps e.g. no single body responsible for the provision of surface water flooding incident response). This complexity is not understood by communities, which leads to incorrect or lack of reporting of flooding when it does occur, meaning the right data is not collected after flood events

- Limited duties on other risk management authorities and the public to maintain and improve surface water assets (such as highway drains, private surface water sewers and watercourses)
- Inconsistent approach to the ownership of surface water assets, which can be confusing for customers and stakeholders
- Assets are typically designed to different return periods leading to no consistent level of protection for a community (e.g. highway drainage 1 in 5, sewers 1 in 30, fluvial networks 1 in 100, etc.)

Lack of resources

- Limited budgets and resources across all organisations with a responsibility for surface water management
- Differing funding cycles of the organisations (6-year Environment Agency programmes, 5-year water industry business plans, annual budgets of local authorities etc.)
- Relatively short-term focus of many of the risk management authorities, results in focussing on addressing issues immediately after flooding occurs. Typically, where authorities are better resourced, more proactive management work is undertaken
- Inconsistent approach to maintenance of drainage assets with the regular use of third-party organisations leading to lack of a joined-up approach
- Management and maintenance of highways drainage
- Maintenance (or lack of) on third-party assets/riparian ownership

Growth

- Growth, including the uncontrolled impacts of urban creep and permitted development rights on legacy drainage systems
- New surface water connections (i.e. new housing developments) being made to networks, including the developers automatic right to connect

Areas needing review/new powers/new funding

- Overland runoff, especially from agricultural land, and lack of consideration of exceedance flow routing in new development planning
- The ongoing use of combined sewer networks for the disposal of surface water in our older communities, with the necessary use of combined sewer overflows and their associated environmental impact
- Receiving watercourses – if drainage networks are not able to discharge to watercourses due to high river levels, then this can increase the risk of surface water flooding. This can be especially difficult where schemes are planned to reduce fluvial flood risk, but surface water flood risk remains
- Groundwater infiltration into aging assets which takes up capacity in networks
- Blockages caused by improper use of sewers (private/water company/highways), including flushing sanitary products and wet wipes, and pouring fats, oils and grease into sewers, creating fatbergs

Further to the central repository and associated duties recommended in our response to question two, we also recommend:

- A. A legislative review of the current roles and responsibilities be undertaken, with the specific aim of achieving better integration of all the flood risk management authorities and their work, together with better clarity and stronger duties to bring leadership to these disparate groups and ensure they act in a coordinated manner for the benefit of customers and society.

- B. Ensuring the funding mechanisms are fit for purpose to allow the flood risk management sector to work in unison and ensuring that communities (including riparian and private owners) can play their part.
- C. Reviewing the effectiveness of planning and development control including the use of monitoring and enforcement.
- D. Providing more control for water companies over new connections, including powers and funding to adequately address misconnections.

Infrastructure solutions

4. What measures can help mitigate and improve the management of the risk of surface water flooding in both urban and rural locations in the short term (next five years) and long term (25 years)? Is there evidence on their cost, effectiveness, and scale of associated co-benefits?

Within the current fragmented system, where multiple stakeholders take differing approaches, flooding is often viewed in isolation and budgets assigned with strict parameters. This issue hampers the best outcomes and measures.

However, some of the greatest opportunities for surface water flood risk reduction help to deliver other benefits too. These include enhanced water quality (whether that be attenuating flows to reduce combined sewer overflow frequency or implementing interventions that also help cleanse the surface water), improvements to local biodiversity, amenity, etc. There is a need for funding mechanisms on all sides to be more agile, in order to encourage partnership working (both between organisations and across internal departments) to deliver the most sustainable surface water management interventions for the communities.

Given the multiple benefits that can be delivered by nature-based solutions (including SuDS), the water industry sees merit in pursuing the use of these measures where appropriate. A number of studies have been undertaken across the country to help quantify the costs, effectiveness and scale of benefits achieved through their implementation (see Ignition with United Utilities and London Strategic SuDS Pilot Study with Thames Water).

Smart technology is being embraced by the water industry to help better manage surface water flood risk, including but not limited to:

- Smart rainwater harvesting systems - tanks connected into weather forecasting systems that purge water prior to rainfall, freeing up sufficient capacity to provide a flood risk attenuation benefit whilst still maintaining a suitable alternative water resource.
- Smart sewer networks – real-time control mechanisms installed at pumping stations or within the sewer network, using actuated valves to control flows during wet weather to maximise the attenuation capacity of the sewer.

The water industry acknowledges the value that educational material within schools can have in spreading the message about improved surface water management (see an [example](#) from Anglian Water of materials created). Given the recent increase in interest in this subject area within the Department for Education, efforts should be made to support greater inclusion of surface water management within

school syllabuses, both from an educational perspective, and to highlight the sector as an interesting, innovative and green career option for students.

Moving forward, the water sector also supports a catchment-based approach and the value of sharing data between organisations and looks to projects, such as [Catchment Systems Thinking Cooperative](#) (CaSTCo), an Ofwat Innovation Fund project, to demonstrate the value in such an approach and how this might be best rolled out across the country.

The initial iteration of Drainage and Wastewater Management Plans is leading to a more integrated approach to surface water management, and further work to develop this partnership working will be undertaken in cycle two of these plans. We recognise the value of other strategic planning tools, such as the Flood Risk Management Plans, Surface Water Management Plans and Development Plans to help steer this integrated approach and we remain keen to support the development of these plans with other stakeholders. We also recognise that there is potential for better integration of other strategic infrastructure plans and associated action plans, and would recommend a consistent approach be taken across the different sectors.

In addition, we would like to see a prioritised approach to address the themes set out in our response to question three, which sets out the framework for integrated surface water management within the next five years. This would allow the sector to move towards the delivery of catchment-based studies and integrated solutions over the longer-term.

5. How might the solutions relevant to the urban surface water flood risk context need to differ for the rural challenge?

Urban areas

In urban areas, the degree of surface water flood risk is primarily driven by the performance of below-ground assets such as culverts and drains. The costs of increasing capacity in these are exponentially higher in urban areas due to the complexities of navigating buried utilities, working with multiple landowners, and avoiding buildings etc. The constraints in urban areas typically favour compact solutions which can be fitted in between existing assets in locations such as highway verges and parks, and mean funding must take into account any cost premium resulting from the complexity. The constraints also mean it is difficult to build in significant future capacity for growth or climate change.

Rural areas

In rural areas, surface water flood risk is primarily driven by the natural hydrology and contours of the land itself. In contrast with urban areas, there is often more land available to build surface water solutions, and more opportunity to avoid physical constraints, such as buried cables and buildings. This increases the opportunity for certain nature-based solutions and can provide greater opportunities for delivering multi-beneficial schemes, and the potential to allow for future demands at an early stage.

Reducing agricultural runoff from land to rivers is key to helping reduce surface water risk, both from a flow rate and path perspective, and in protecting rivers from pollution.

Infiltration into drains

In the specific case of groundwater infiltration into public drains, this issue is greater in rural areas where the greater distances between properties means larger expanses of private networks connect to public

networks. This causes significant issues for water companies because infiltration of relatively clean groundwater takes up much of the capacity needed to convey water prior to treatment, and increases the risk of flooding. While the water companies routinely carry out work such as preventative lining on their public networks, encouraging third parties to repair their upstream private networks is extremely challenging and rarely results in positive action. The risk of surface water flooding is increased where groundwater infiltrates in both wet and dry weather, and this can impact both the immediate rural area and urbanised areas in the network.

Riparian ownership

The roles and responsibilities of riparian owners are often misunderstood and this causes significant flood risk issues nationally. Greater information and training would support riparian owners and the agricultural sector to help reduce the surface water flood risk both to their own property and that of others.

In addition, taking a more holistic (catchment) and collaborative view of the challenges and opportunities for surface water management in both rural and urban areas would likely result in more nature-based solutions being prioritised overall.

6. Is there evidence of best practice, nationally or internationally, that can inform the development of effective approaches to the management of surface water flooding?

There is significant evidence of good practice being delivered across the UK's water industry around surface water management, many of which will be included within the water companies' individual responses to this consultation. These include:

- Anglian Water and Dŵr Cymru Welsh Water's "Partnership Funding Programmes" – a dedicated funding pot to support multi-beneficial flooding projects instigated by other risk management authorities
- Northumbrian Water's "Northumbria Integrated Drainage Partnership" – establishment of a multi-agency partnership working together to reduce the communities' risk of flooding from all sources
- Severn Trent Water's "Mansfield Green Recovery surface water management / SuDS project" – Major catchment-wide SuDS retrofit project for this AMP. The aim is to remove 58,000m³ of rainfall-induced flow from the sewer network by installing more nature-based solutions like raingardens, impermeable roads and larger swales / SuDS. This includes working with the local council and Environment Agency to help leave a long-lasting legacy for this catchment area
- Thames Water's "London Strategic SuDS Pilot Study" – a multi-organisation partnership project to demonstrate the aggregated benefits of small-scale SuDS delivery with the aim to influence changes to the existing flood risk funding allocation methodology and showcase the types of interventions that can be delivered within an urban setting
- Yorkshire Water's "Living with Water partnership" – a sustainable approach to water management in Hull and East Riding
- United Utilities' "Ignition Project" – partnership project that aims to develop innovative financing solutions for investment in Manchester's natural environment and build the region's ability to adapt to the increasingly extreme impacts of climate change

The fragmented legislative framework and lack of national funding for surface water management, means schemes only progress where committed groups of local stakeholders come together to implement solutions. Water companies are actively helping catalyse this action by collaborating with interested

parties, highlighting the importance of partnership working when addressing surface water flood risk. However, the scale of the challenge from climate change is too great to resolve using the current fragmented approach and a holistic framework is needed nationally.

7. What solutions are on the horizon to better manage assets to minimise surface water flooding and at more efficient cost?

Partnership working is critical to deliver flood risk reduction efficiently, especially as we aim to deliver broader environmental outcomes under the Environment Act, using multi-beneficial solutions.

Recognition needs to be given by Government and regulators, that flexibility is crucial in order to facilitate partnership working. This includes a flexibility to:

- Do the right thing (which is not always the cheapest option), such as using blue-green infrastructure over more traditional ‘grey’ options that have more established and understood cost/benefit models. Funding mechanisms need to be altered to account for the best overall value for money (for our customers/bill payers/taxpayers)
- Align funding cycles to ensure organisations can work together and navigate funding streams to provide the right outcomes (not just outputs) and multiple benefits (reduced flood risk, enhanced biodiversity and/or amenity)
- Take an adaptive approach
- Share data more freely on the location and condition of surface water infrastructure

8. What are the costs and benefits of nature-based solutions and sustainable drainage systems (SuDS) in managing surface water flooding? How can these solutions contribute to biodiversity net gain?

While the sector has well established cost models for ‘grey’ infrastructure, the costs/benefits of nature-based solutions are typically less well-understood in comparison, especially in terms of monetising the different (biodiversity, amenity, health) benefits that they provide. At present, the Government’s Green Book is not used systematically by sector policy makers, meaning significant opportunities to secure wider benefits are not identified during the policy making stages.

In the absence of a comprehensive tool at national policy level, there are some opportunities to integrate multi-beneficial solutions at scheme level, for example solutions providing biodiversity net gain (through nature-based solutions) in conjunction with flooding schemes/solutions. Accounting for carbon in fluvial schemes is now being undertaken, which is steering solutions towards nature-based blue-green infrastructure too. There are, however, barriers to delivery of these opportunities under the current framework, because the current funding mechanisms are a hindrance to a seamless collaborative approach.

The [CIRIA BEST](#) tool is one multi-capital accounting approach, which is already used within the flood risk management industry to assess and monetise many of the financial, social and environmental benefits of SuDS and blue-green infrastructure. The results enable users to understand and quantify the wider value of SuDS and natural flood management measures. This can support investment decisions and help to identify stakeholders and find potential funding routes. The use of this within flood risk management decision making is increasing, and we would support its widespread adoption.

The [Storm Overflow Evidence Project](#) looked at this area from the context of Catchment Based Approaches on overflow mitigation. This high-level work includes significant uncertainties around SuDS estimates and it is very likely that they will be more attractive in certain locations than the report suggests.

Behaviour change and resilience

9. What key individual and household behaviours increase the risk of surface water flooding? Is there evidence on successful schemes that have led to behaviour change?

Key individual and household behaviours that increase the risk of surface water flooding include:

- The inconsistent understanding nationally of individual and household responsibilities to manage surface water flood risk (including maintaining private drains and riparian watercourses)
- The inconsistent understanding nationally of the risk (i.e. many believe that they are not at risk of flooding if they live on a hill, or far from a river including if they are not in a flood warning area as covered by the Environment Agency's fluvial flood warning system)
- Customers flushing unsuitable materials (sanitary products, wet wipes, and other 'unflushables') and pouring fats, oils and grease down drains and sewers. Successful schemes to reduce this include Anglian Water's "Keep it Clear" and Northumbrian's "Bin the Wipe" campaigns. These products cause 300,000 sewer blockages or 'fatbergs' every year in the UK. Sewer blockages cost water customers £100 million annually to resolve and have a major impact on the environment, resulting in serious incidents of river pollution and posing a severe threat to wildlife. Thousands of properties suffer sewer flooding caused by wet wipe-originated blockages every year, causing distress for homeowners and businesses, and leading to high clean-up bills and increased insurance costs
- The inconsistent management of urban creep and other permitted development rights and lack of enforcement (e.g. drainage from new conservatories, or patio extensions etc), so as to prevent increasing impermeable areas that cause further strain on surface water sewers. The latter will be especially important if the take up of electric vehicles results in new off-street spaces to charge these vehicles

Water company research has found that customers tend to better understand the risks and be more open to manage surface water risks to their properties when:

- They can clearly see the benefits for them personally (e.g. lower bills, less risk of flooding)
- The solution is inexpensive to buy and install
- Installation and upkeep are easy

(see individual water company responses for more detail)

However, even where schemes have successfully raised the level of awareness, customer understanding of these risks and any associated behavioural change can be short-term without repeated messaging.

In relation to property-level resilience measures or the use of SuDS within property curtilages, it will be critical that current, and future property owners also understand the importance of these measures to their own protection. Experience has shown such measures may be modified or removed by the occupier unless they are aware of their intended purpose.

10. What challenges and opportunities are presented by the increased government focus on reducing spills from stormwater overflows?

Challenges:

- The fundamental purpose of the combined sewer overflow is to reduce flood risk from our combined sewers to acceptable levels and protect customers. Reducing overflow volumes and / or increasing the level of flood protection to upstream properties is a significant challenge that would put pressure on customer bills
- Funding investment varies across the fragmented system of responsibilities, and this restricts collaboration
- There is concern that the Storm Overflow Programme may miss the opportunity to bring flood risk into other programmes such as WINEP. See ten actions for change in our [21st Century Rivers report](#)
- Targets on overflows will need to be carefully designed, outcome based, and avoid perverse outcomes. Targets should avoid environmentally harmful or unduly expensive solutions that could divert funding away from more socially beneficial or nature-based solutions
- Pressures to deliver the programme of improvement at pace could result in the use of traditional, and potentially more carbon-intensive solutions, which are faster to deliver and come with the perceived benefits of greater performance confidence, when compared with more sustainable blue/green infrastructure

Opportunities:

- As public and stakeholder awareness increases on the impact of combined sewer overflows, this will generate conversations about the changes which need to take place to support environmental improvements and reduced discharges, many of which will require the support of other risk management authorities and customers in order to be delivered
- To deliver increased green infrastructure in collaboration with other stakeholders (as opposed to just a water company chasing a one-dimensional flooding/pollution target), removing siloed working
- To align funding/investment to achieve multiple outcomes from single objective, by working with multiple stakeholders. Promoting SuDS and nature-based solutions as the default option to reduce harm from storm overflows, where the focus for SuDS retrofit is on water quality, not flood risk (in line with other countries)

11. Considering that better asset management will be key to improving climate resilience, how should the appropriate balance between investment in existing and new flood and drainage infrastructure be assessed?

Best practice asset management is critical to maintaining existing and future asset resilience, and in meeting the challenge of climate change.

Maintenance is crucial to delivering asset capacity (volume, throughput, and capability) to enable essential services to be provided. Maintenance on non-water industry assets and systems is also critical, but maintenance is consistently underfunded across all of the stakeholders involved.

In addition to maintenance, retrofitting SuDS and other nature-based solutions to remove surface water from sewer networks must also be undertaken by all of the bodies with responsibilities for surface water management, including private companies, landowners and individuals. Future frameworks should ensure these are appropriately funded and managed by organisations able to deliver large and complex investment programmes.

We also recommend that the central repository that we described in our response to question two is also used to inform where maintenance and/or new interventions are needed. Maintaining the repository with the latest status for these actions will also improve other stakeholders' ability to prepare for climate resilience.

We would also advocate catchment scale assessment, potentially through integrated hydraulic modelling to better understand the interactions between surface water systems and the way solutions can best be delivered. Such long-term planning studies will require additional asset data through detailed location and condition surveys, requiring significant initial investment in our knowledge of how catchment drainage operates in an integrated way, and how it can best be adapted to meet the long-term needs of those communities.

Governance and decision making

12. What are the strengths and weaknesses of the current approach to taking account of and managing the risk of surface water flooding where responsibilities are split across different bodies? How should this be regulated and governed in future to support effective management of the risk?

The fragmented approach to managing surface water risk currently applied by frameworks in the UK hampers collaboration and common understanding of the best solutions. This is exacerbated by the lack of agreed definitions for key terms used to define surface water flooding. For example, the Flood and Water Management Act refers to Lead Local Flood Authorities having the responsibility for 'surface water runoff', which is rainfall on the surface (whether moving or not) and rainfall which has not entered a watercourse, drainage system or public sewer; whereas the broader view is that surface water flooding includes flooding from highway drains, sewers, private drainage systems, etc. Consistent definitions and shared understanding across organisations would help stakeholders work together in the common interest.

Surface water flood risk is a shared responsibility and the management of this requires strong multi-agency cooperation, collaboration and coordination. However, the complexities of the current fragmented arrangements mean it can be difficult to work out how these responsibilities work in practice, and lead to confusion between the parties trying to reduce the flood risk. For example, it is often very difficult to distinguish between flooding from surface water runoff that has not yet entered a drain, versus flooding arising because there is insufficient provision of 'inlets' into formal drains; versus flooding because the drainage networks are full. Because different organisations will be involved depending on the root cause of the issue, the process is confusing and challenging for all.

Weaknesses of split responsibilities:

- Different funding/investment cycles between risk management authorities (6-year Environment Agency programme vs 5-year water company business plans vs 1-year local authority budgets)

- Funding for flood risk management is not ringfenced for local authorities
- Funding criteria is not favourable for surface water schemes and does not help to facilitate collaborative action (i.e. grant in aid is harder to obtain for surface water schemes than traditional fluvial schemes, even though the risk of surface water flooding is higher)
- Unclear roles and responsibilities (particularly around incident response)
- Limited duties on risk management authorities to take action to manage, plan for and improve surface water infrastructure
- Different asset design standards and levels of flood protection provided (e.g. 1 in 5 for highway drainage, 1 in 30 for sewers)
- Lack of consistent data on surface water flood risk nationally (see our response to question two)

Strengths of split responsibilities:

- Enables a local focus for surface water management

Further to the central repository and associated duties recommended in our response to question two, we also recommend:

- A. A legislative review of the current roles and responsibilities be undertaken, with the specific aim of achieving better integration of all the flood risk management authorities, their data and their work, together with better clarity and stronger duties to bring leadership to these disparate groups and ensure they act in a coordinated manner for the benefit of customers and society.
- B. A review and strengthening of the legislation for the specific roles and responsibilities for surface water incident management be undertaken, including planning for, responding to and recovering from surface water flooding. This should include a consistent and clear definition and understanding across organisations of surface water flooding. This should also include adequate funding to deliver the role/s.
- C. Reviewing and ensuring that the funding mechanisms are fit for purpose to allow the flood risk management sector to work in unison and that communities (riparian and private owners) can play their part. This should include:
 - Ringfenced funding for flood risk management for local authorities
 - Reviewing and aligning funding cycles, to facilitate and increase collaborative action
 - Providing easier access to the available funding to facilitate and increase collaborative action (i.e. grant in aid is harder to obtain for surface water schemes than traditional fluvial schemes, even though the risk of surface water flooding is higher)
 - Providing clear guidance and best practice for adaptive approaches to flood risk management, with the recognition that there will be a threshold where investment to reduce flood risk is no longer appropriate, and therefore clear guidance on what to do next when this is the case
 - National funding for educating private and riparian owners and facilitating them to take action and do their part

13. What improvements can be made to planning for, response and recovery following a surface water flooding event?

At present, there are no mandatory response responsibilities for surface water flooding in England (as highlighted in the [Jenkins review](#)). Depending on the location and the severity of flooding, fire and rescue, water companies, local authorities (including highways), the Environment Agency and other risk management authorities, may provide some form of support where possible.

Improvements needed:

- Clear, mandatory roles and responsibilities in relation to surface water flooding incident response
- Funding to adequately deliver the roles of respective parties
- Developing, and formalising the links between different risk management authorities to facilitate the incident response service
- Improving how flooding is reported, recorded, and investigated and how the findings are published, including providing a consistent approach for the different flooding sources
- A review of the Civil Contingencies Act 2004 and Flood and Water Management Act 2010 in relation to surface water flooding events to ensure they are fit for purpose
- National coverage of a surface water warning system (i.e. an extension of the flood warning system used and managed by the Environment Agency). Systems set up by individual Lead Local Flood Authorities will vary and further exacerbate the complexities/disjointed approach (leading to potential postcode lotteries). Differences in approach also do nothing to help a shared understanding of the problem and can increase the uncertainties felt by communities (e.g. having to sign up to and use multiple systems for home/work/caring for relatives)

We recommend:

- A. A legislative review of the current roles and responsibilities be undertaken, with the specific aim of achieving better integration of all the flood risk management authorities, their data and their work, together with better clarity and stronger duties to bring leadership to these disparate groups and ensure they act in a coordinated manner for the benefit of customers and society.
- B. A review and strengthening of the legislation for the specific roles and responsibilities for surface water incident management be undertaken, including planning for, responding to and recovering from surface water flooding. This should include a consistent and clear definition and understanding across organisations of surface water flooding. This should also include adequate funding to deliver the role/s.
- C. Setting up a national surface water warning system to work with the existing fluvial flood warning service managed by the Environment Agency.

Funding and finance

14. What is the long term (25 years) investment need for surface water flood risk management that will maintain and increase resilience? Please provide evidence or explain the rationale for your estimate.

Because of the fragmented nature of the existing frameworks, the total long term investment need is not properly understood by the various stakeholders involved in managing the risks.

The Environment Agency's [Long Term Investment Scenarios](#) (LTIS) contains a figure for additional annual investment to manage surface water flooding (£44million) over and above the existing baseline expenditure on surface water flooding. However, the baseline figure is not known because it is interlinked with other sources of flooding. The Environment Agency recognises there is evidence that the LTIS 2014 (previous version) baseline underestimated the amount of investment needed to manage the risk from surface water. The Environment Agency suggests that further work is needed to understand the uncertainty, costs and benefits of surface water management.

Based on evidence from PR19, this figure is remarkably insufficient when you consider investment requirements for both water companies and Lead Local Flood Authorities across England. We also need to understand whether the Environment Agency's estimations are created using traditional (usually 'grey') infrastructure or whether SuDS, nature-based solutions and blue-green infrastructure is being incorporated and/or encouraged (the costs of each type will vary significantly).

Further work using an integrated approach is required on the evidence base (data, modelling, mapping) to understand the 'true picture' for surface water flood risk. The Environment Agency's NaFRA2 (National Flood Risk Assessment) project is underway, but this may not be able to provide a full picture. Integrated plans across catchments, which fully quantify flood risks will be needed to inform more detailed investment analysis. Water companies are currently developing their draft DWMPs, and future cycles may provide a consistent national picture of the scale of water industry investment. Work to bring together all plans into one integrated and consistent evidence base is required to understand the true risk of surface water flooding and the investment need for its management.

We recommend that:

- A. A central repository be established, so that all surface water assets can be appropriately captured and then incorporated within any future updates to surface water modelling for any given area. The current asset register requirement (under the Flood and Water Management Act) does not go far enough and the uptake of this duty is disjointed, with differing approaches being taken nationally.
- B. The revised duty for a central repository would need to be managed and maintained by a national body (the Environment Agency may be best suited under their strategic overview role). This would be accompanied by a consistent (and proportionate) approach to the required standards of this information. The national body would also be responsible for ensuring the data is accessible. A standardised approach to data and information sharing among flood risk management authorities will facilitate better coordination and collaboration for surface water management and it will also assist water companies in the preparation of their Drainage and Wastewater Management Plans.
- C. A duty requiring all risk management authorities and developers to use the repository before undertaking any modelling or work that could alter the risk of surface water flooding. This would encompass a duty to update the repository after any changes have been made (including after undertaking schemes to address other flood risk sources).
- D. Future updates to the Long Term Investment Scenarios should also use this central repository to give an updated, accurate reflection of the risk, costs and benefits of addressing the risk of surface water flooding.

15. How should funding for investment in surface water flood risk management be split between consumers and taxpayers?

Until we have clearer roles and responsibilities for surface water management, understand the true risk of surface water flooding, and the costs and benefits of surface water management, it's difficult to discuss how to split the investment. Surface water flooding is influenced by a complex mixture of factors including land use, weather, climate change, and housing growth. As a result, much of the funding for addressing flooding is raised through taxes and managed through government in line with their statutory duties.

There is a clear need for coordination between the government departments, private organisations and individual landowners across which surface water management responsibilities are split. Innovation, collaboration and longer-term planning is essential to ensure there is adequate funding for surface water management and increasing climate resilience for our communities.

A better understanding of the true risk of surface water flooding, as well as where interventions are taking place would allow for an updated national picture on the investment need. A single national body being responsible for the overall management of surface water could support improved collaboration and innovation and potentially bring efficiencies over time, reducing the burden on those providing the funding.

Any changes to these funding arrangements would need careful analysis to ensure they are supported by communities in line with regulatory frameworks and do not impact on vulnerable consumers.

We recommend:

- A. A legislative review of the current roles and responsibilities be undertaken, with the specific aim of achieving better integration of all the flood risk management authorities, their data and their work, together with better clarity and stronger duties to bring leadership to these disparate groups and ensure they act in a coordinated manner for the benefit of customers and society.
- B. A review and strengthening of the legislation for the specific roles and responsibilities for surface water incident management, including planning for, responding to and recovering from surface water flooding. This should include a consistent and clear definition and understanding across organisations of surface water flooding. This should also include adequate funding to deliver the role/s.
- C. Future updates to the Long Term Investment Scenarios should use the central repository (recommended in our response to question two, eleven, twelve and fourteen) to give an updated and accurate reflection of the risk, costs and benefits of addressing the risk of surface water flooding.

Contact details

Emily Clarke

Climate Change Policy Manager

eclarke@water.org.uk