Planning for flood risk

Topic resource

Planning for the Climate Crisis: A guide for local authorities

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Environment Agency

Project Groundwater
Are you flood resilient?

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Introduction

One of the most important roles of the planning system in relation to climate change is to secure the safety of communities and future development from the risk of flooding. This requires a strong understanding of flood risk from *all sources*, where flooding is a risk factor now, and how this is likely to change in future.

The latest national flood risk assessment states that 6.3 million properties in England are currently in areas at risk of flooding from rivers, the sea and surface water. This could rise to 8 million by the mid-century - representing one in four properties.[1] This does not include properties at risk of groundwater flooding.

Climate change is the driving factor in this change, with the Environment Agency projecting a 73% increase in properties at highest risk from river and coastal flooding, and a 30% increase in exposure to surface water flood risk by 2069.[2]

Despite this increased risk, the planning system continues to permit new development in areas of flood risk with around 7% of new residential addresses created in Flood Zone 3 in recent years.[3] Planners must play a proactive role in ensuring that development is located in the areas of least vulnerability to the risks of flooding from all sources, and make sure that safeguards and mitigations are delivered in development to support the long term safety of communities.

Flood risk and water management is an area with significant variation in the policy approach across the UK nations. Although many of the principles and best practice set out in this resource are relevant to all UK nations, the policy context section is applicable only to England.

This guidance forms part of a suite of guides on planning for climate adaptation and should be read alongside the resources on planning for long term adaptation, coastal planning, and water scarcity. These are available here.

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Policy Context

National Planning Policy Framework (NPPF)

In England, the NPPF sets a sequential, risk-based approach to flood risk, in order to direct development away from areas of highest risk of flooding.[4] To apply this successfully, planners require an up to date understanding of flood risk from all sources, which should be drawn from evidence including the national flood and coastal erosion risk mapping[5] and the local Strategic Flood Risk Assessment (SFRA). The NPPF is also clear that planning authorities must consider the impacts of climate change on long term vulnerability to flooding. Where development is necessary in areas at risk of flooding, development should be made safe for its lifetime without increasing flood risk elsewhere.

The sequential and exception tests are the foundation of flood risk policy for planning in England. They are applied through plan making and decision making to make sure sites at lower risk of flooding are given preference for development. The Environment Agency categorises flood risk from the rivers and the sea into Flood Zones 1, 2 and 3, with zone 3 being the highest category of risk. Paragraph 174 of the NPPF explains the role of the sequential test.

Box 1: National Planning Policy Framework, Paragraph 174

'Within this context the aim of the sequential test is to steer new development to areas with the lowest risk of flooding from any source. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower risk of flooding. The strategic flood risk assessment will provide the basis for applying this test.'

If the sequential test is passed, some development types must also apply and satisfy an additional test known as the exception test. Both parts of the exception test need to be satisfied for a site to be considered suitable for allocation or permission.

Box 2: Extract from National Planning Policy Framework, Paragraph 178

To pass the exception test it should be demonstrated that:

a) *the development would provide wider sustainability benefits to the community that outweigh the flood risk; and*
b) *the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.*

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A crucial aspect of the NPPF is 'taking into account *all sources of flood risk* and the *current and future* impacts of climate change'[6] (emphasis added). This means that planners will need access to information about flood risk from surface water, groundwater, reservoirs as well as from the rivers and sea, and also account for climate change, to undertake the sequential and exception tests.

The Environment Agency's Flood Map for Planning provides flood risk data for river, sea and surface water flooding. The SFRA may provide more granular data on these flood risk sources and is also important in providing information on other sources of flood risk such as reservoir and groundwater flooding.

Planning Practice Guidance

The Planning Practice Guidance (PPG) on flood risk and coastal change provides detailed guidance on the application of flood risk policy for planning including the sequential and exception tests and mitigation measures to ensure development is safe from flood risk and does not increase the risk of flooding elsewhere. It also sets out circumstances where certain development types are considered incompatible with some Flood Zones and should not be permitted.

The PPG outlines the steps for taking flood risk into account in the preparation of strategic planning policies. This could be through preparation of a local plan, a neighbourhood plan (especially if it is allocating land for development) or through preparation of a spatial development strategy. Or indeed through all of the above.

The process relies on the use of evidence on all sources of flood risk to inform strategic policies throughout their development. This evidence should be contained in an up-to-date Strategic Flood Risk Assessment (SFRA) for the plan area.

PPG also provides guidance on how flood risk policy should be applied in planning decisions, and the use of flood risk assessments (FRAs) for planning applications. Training on the production and use of flood risk assessments for plan making and development management is available from the TCPA and the Environment Agency.[7]

The design of communities and buildings is also an important consideration for climate adaptation, and the **National Model Design Code** guidance (which forms part of the PPG) highlights the need for well-designed places to respond to adaptation to anticipated events, including the increasing risk of flooding.

Roles and responsibilities for flood risk management

There are many organisations involved in the management of flood risk, all of which have a role to play in supporting planning for flood risk.

Box 3: Key roles and responsibilities for flood risk management

The **Environment Agency** has oversight of the management of all sources of flooding and coastal erosion but is directly responsible only for managing the risk of flooding from main rivers, reservoirs, estuaries, and the sea. The Environment Agency is a statutory consultee including for planning applications in Flood Zones 2 and 3 and in proximity to main rivers. They must also be consulted during the preparation of local plans.

Lead local flood authorities (LLFAs) are responsible for managing local sources of flood risk, in particular surface water run-off, groundwater, and ordinary watercourses. LLFAs are statutory consultees on major development involving surface water drainage.

Local planning authorities make decisions on planning applications and are responsible for developing local plans, which include policies on addressing flood risk in developments. Local planning authorities must seek expert advice from organisations such as the Environment Agency and the Lead Local Flood Authority in the circumstances described above, but they may also seek advice from other risk management authorities if other flood risk issues are identified.

Other organisations that engage in planning for flood risk (depending on the context for the local planning authority) include other risk management authorities such as internal drainage boards and water and sewerage companies. Advice could also be sought from district council in their role as the coast protection authority.

Guidance on Flood risk emergency plans for new development, produced by the Environment Agency and ADEPT, encourages the preparation of local guidance and consultation arrangements. These are to ensure that the policy requirements for development to include safe access and escape routes where appropriate, as part of an agreed emergency plan, are upheld. These should set out the standards expected locally and confirm when consultation with local authority emergency planners, the emergency services, and the local resilience forum should be undertaken.

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Key principles

The following principles should underpin how planning authorities promote resilience to flood risk and support effective water management:

- The flood risk hierarchy should underline local planning authorities' approach to flood risk management, which puts avoidance front and centre in the approach to flood risk. This means building in areas of flood risk should be avoided unless absolutely necessary, and there is a high bar to pass for development to be permitted in areas at risk of flooding.

Figure 1: The flood risk hierarchy as set out in the NPPF and PPG.

- Catchment-based planning should be integrated into spatial plans, so that flood risk, water quality and water management is coordinated at a strategic scale.
- Development should be steered away from areas of current and future flood risk from all sources, through the application of the sequential and exception tests.
- Opportunities should be taken to reduce overall flood risk, for example through the incorporation of Sustainable Drainage Systems (SuDS) and natural flood management.
- Land likely to be needed for future flood risk management infrastructure and natural flood management should be safeguarded from development.
- Evidence on flood risk should be kept up to date and reflect the most recent data and information. The Environment Agency, ADEPT and CIWEM have produced a good practice guide for Strategic Flood Risk Assessments in England,[8] which supports guidance on how to prepare a strategic flood risk assessment.[9]

Figure 2: Flooding can arise from a range of sources, including failure of drainage infrastructure.
Source: malgosia janicka / Shutterstock.com

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The importance of Sustainable Drainage Systems (SuDS)

Surface water flooding occurs when heavy rainfall overwhelms the drainage available, and water is backed up at the surface level. 4.6 million properties are at risk of surface water flooding in England, and it is also the most rapidly increasing source of flood risk. Development often increases impermeable surfaces, which can lead to increased surface water run-off. SuDS are an essential water management approach which replicate natural water flows and ensure that drainage systems do not become inundated during periods of heavy rainfall.

SuDS should be designed to capture other positive benefits, such as providing habitats for wildlife, amenity value, increasing access to nature and improving water quality. Analysis for CIWEM also demonstrates the economic value of SuDS compared to traditional drainage systems.[10] Planning policy for SuDS was strengthened in the December 2024 update to the NPPF, to require their integration into all developments that could affect drainage on or around the development site.[11]

The National standards for sustainable drainage systems should be used to guide the design, maintenance and operation of SuDS. They were updated by DEFRA in summer 2025, including more emphasis on water quality, amenity and biodiversity benefits. They are available here: https://www.gov.uk/government/publications/national-standards-for-sustainable-drainage-systems

CIRIA's 'Getting SuDS right from the start' project provided free guidance and an animation to encourage developers, land agents and master planners to think about SuDS early in the development process. They highlight how early action can transform drainage from a constraint into an opportunity, unlocking site value and creating developments fit for the future.

Figure 3: SuDS offer multiple benefits and can add interest to well-designed places. Source: TCPA.

Flood risk evidence

In 2025, the Environment Agency launched major updates to England's national flood and coastal erosion risk datasets. The new National Flood Risk Assessment (NaFRA2) integrates high-resolution modelling of flood risk from rivers, the sea, and surface water, incorporating UKCP18 climate projections to show both current and future risk. The updated National Coastal Erosion Risk Map (NCERM) draws on a decade of coastal monitoring data and shoreline management plans to model erosion risk under varying climate and funding scenarios.[12]

Evidence on flood risk should consider strategic scale water management across the catchment area. This means plan evidence should draw on a range of evidence sources such as flood risk management plans, catchment plans and river basin management plans to inform how development can contribute to achieving the broader water management strategy for the area. Local authorities can also save money and encourage a more holistic approach to the causes and effects of flooding across administrative boundaries, by producing a joint Strategic Flood Risk Assessment (SFRA) with neighbouring authorities.

A robust and up to date SFRA will be fundamental to a successful approach to flood risk in the development plan. It should also be used to support decision making. The SFRA should assess the vulnerability of the plan area to all sources of flood risk, and account for increased risk over time due to climate change. This means the SFRA will identify current and future flood risk from rivers and sea, and locations susceptible to other sources of flooding, including from surface water, groundwater and reservoirs.

Flood risk datasets are being updated and improved all the time. It is therefore essential that SFRAs are produced and maintained as living documents which can be quickly and easily updated to ensure they always reflects the best available information.

For individual planning applications in flood risk areas, site-specific flood risk assessments are a crucial part of the planning application. These should be given due consideration by the applicant, and the LPA should be satisfied that the FRA is of a suitable standard and covers all relevant flood risk considerations. An important part of the FRA is the list of mitigation measures, which may include site level as well as property level interventions. Planners must ensure these are reflected in planning proposals and secured through planning.

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Box 4: Understanding all sources of flood risk

Flooding can come from a range of sources. The main sources of flooding include tidal flooding (from the sea), fluvial flooding (from rivers), surface water flooding, groundwater flooding and sewer flooding. Flooding can also come from artificial sources like reservoirs, canals and lakes.

Each of these sources of flood risk, including how they may interact with one another and change in future due to climate change, must be understood in the local context to inform locations for development and development decisions. Planning guidance requires planning decisions to consider two main scenarios:

- The design flood - Flooding of a particular likelihood, considered to be a reasonable worst-case scenario.
- Residual flood risk - including things like the failure of flood defences and more extreme flooding.

Planners must ensure that development is located and designed to be safe in both scenarios.

Good practice for plan making

Successful adaptation policy involves much more than simply considering flood risk in isolation. It has to take account of a broader range of climate impacts and their complex interactions. Holistic and integrated planning is needed over the long term, with local development plans well placed to take a central role.

When creating a spatial development strategy, or local plan, the LPA should:

- Assess all sources of flood risk, how climate change will affect those risks in the long term and identify opportunities where development may reduce the causes and impacts of flooding.
- Ensure that the relevant Environment Agency's advice on flood risk assessment and the local development plan is adhered to.
- Apply the sequential test correctly and thoroughly in order to steer development away from flood risk areas. Where development is necessary in flood risk areas, the

exception test, where relevant, should be applied to demonstrate that the wider sustainable benefits of the development will outweigh the flood risk.

- Promote the use of suitable property level flood resilience measures, both for new buildings and to support the retrofit of existing buildings to increase resilience.
- Integrate policy requirements to secure 'win-win' outcomes, for example identifying opportunities for on- and off-site biodiversity net gain that also reduce flood risk.
- Identify and allocate land in the local development plan to be safeguarded for climate adaptation measures that are likely to be needed in future, including land for new traditional flood defences, natural flood management schemes and water storage.

Box 5: Project Groundwater case study

Flooding from groundwater happens when the level of water within the rock or soil underground – known as the water table – rises and seeps through the surface to reach ground level. Groundwater flooding is not as well understood as other sources of flood risk, but the impacts can be significant. As well as damage to property and infrastructure, it also has the potential to contaminate drinking water.

Project Groundwater is a six-year Defra funded programme working with communities in the Chiltern Hills and Berkshire Downs, where risk from groundwater flooding is particularly high because of the chalk and gravel aquifers underground.

The project has identified groundwater as routinely overlooked in the planning process, as there are no specific statutory consultees for groundwater flooding. The project also identified that there is no national open-source or freely available mapping of groundwater flood risk. It is not included within the current Flood map for planning or NaFRA2. As compared to flood risk from the river, sea, and surface water, it is very difficult and expensive to mitigate groundwater flood risk in development. Understanding and avoiding or adapting to the risk is therefore very crucial for development planning.

The project is seeking to raise awareness of groundwater flood risk within local authorities and other stakeholders engaged in planning and flood risk management and is developing guidance to improve consideration of groundwater flood risk within plan making and development management, which is due for publication in 2026.

There is a high level of uncertainty about how climate change will impact groundwater flood risk. While wetter winters, increased frequency of storm events and rising sea levels have the potential to increase risk, milder and drier summers are likely to reduce groundwater levels. Planners and developers should therefore use the most up to date information on climate impacts in their plans, guidance for developers and development management.

Planners in areas of groundwater flood risk should:

- Include a clear and specific requirement to address groundwater flood risk within local planning policies and guidance, to increase the visibility of the risk.
- Ensure that the SFRA for the authority area includes groundwater flood risk mapping or information for their area.
- LPAs should explain the different levels of groundwater flood risk demonstrated through mapping or information provided in the SFRA and provide guidance on how this should be used in applying the sequential test, plan making and development management.
- Where groundwater flood risk cannot be avoided, a more detailed local investigation is likely to be required to make the development groundwater flood resilient. This would require involvement of an appropriately competent professional.

Link: https://www.projectgroundwater.co.uk/

Figure 4: Flooding causes long term disruption to affected communities. Source: Frodo's Dad / Shutterstock.com

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Decision making

In determining planning applications local planning authorities are recommended to:

- Ensure applications are supported by a suitable site-specific flood risk assessment.
- Make sure that the sequential and, where appropriate, the exception tests have been applied robustly to development sites and have considered all sources of flood risk.
- Ensure applications are supported by a SuDS Strategy setting out how multi-functional sustainable drainage systems (SuDS), designed in accordance with the national standards for sustainable drainage systems, have been included. CIRIA has produced technical guidance for practitioners on the delivery of SuDS.[13]
- Ensure that green and blue infrastructure are incorporated into new developments to help reduce flood risk.
- Make sure that any measures identified in the flood risk assessment that are necessary for addressing flood risk, are clearly secured in any planning permission granted.
- Apply the DEFRA SuDS technical standards when determining planning applications with drainage implications.
- Where appropriate, secure developer contributions for flood and coastal risk management infrastructure.
- Permission should not be granted if a development proposal cannot demonstrate that it will be safe and flood resilient over its lifetime, without increasing risk elsewhere.
- Consider the long-term maintenance and stewardship arrangements of flood risk and water management assets.

Box 6: Further learning

The TCPA and the Environment Agency have developed training for planning and flood risk officers on a range planning for flood risk topics, including the application of the sequential and exception tests for plan making and for decision making, which provides more detail on how to apply these in practice. Other online modules available to planners include:

- An introduction to planning for flood risk in England
- SFRAs and flood risk evidence for plan making
- Flood risk assessments for planning applications
- Surgeries and tutorials on technical aspects of planning for flood risk including climate change allowances, functional floodplains and flood risk standing advice.

These can be accessed at https://learning.tcpa.org.uk

Further Resources

CIWEM Be Flood Ready – Property Flood Resilience (PFR)

Community of Practice consolidating PFR resources and good practice; hosting and signposting to events and accredited training; sharing industry news. Link: https://befloodready.ciwem.org/

DEFRA - National Technical Standards for SuDS

The National standards for sustainable drainage systems should be used to guide the design, maintenance and operation of SuDS. They were updated by DEFRA in summer 2025 and are available here: https://www.gov.uk/government/publications/national-standards-for-sustainable-drainage-systems

Environment Agency – Flood risk data

National dataset and mapping of river, sea and surface water flooding. Link: https://flood-map-for-planning.service.gov.uk/

Environment Agency - How to prepare a strategic flood risk assessment

This guide supports local planning authorities in carrying out a strategic flood risk assessment. It breaks down what the SFRA should assess and identify, as well as the steps of the process.
Link: https://www.gov.uk/guidance/local-planning-authorities-strategic-flood-risk-assessment

Environment Agency and ADEPT guidance on Flood Risk Emergency Plans for New Development. Link: https://www.adeptnet.org.uk/documents/adeptea-flood-risk-emergency-plans-new-development

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Cover image: Construction alongside the New Cut, in Bristol. Source: TCPA
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