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## Abstract

There are a large number of properties at risk from surface water flooding in the UK, and it is likely to increase in the future. Using traditional approaches to fix flooding problems is expensive and could quickly become unsustainable if risk increases as expected. So, the UK water industry is planning to use more sustainable approaches such as SuDS and designing for exceedance.

We have two projects aiming to increase uptake of both of these approaches. We are seeking case study examples to develop evidence based guidance and tools. If you can help please contact [Suzanne.Simmons@ciria.org](mailto:Suzanne.Simmons@ciria.org)

## FLOOD RISK IN ENGLAND

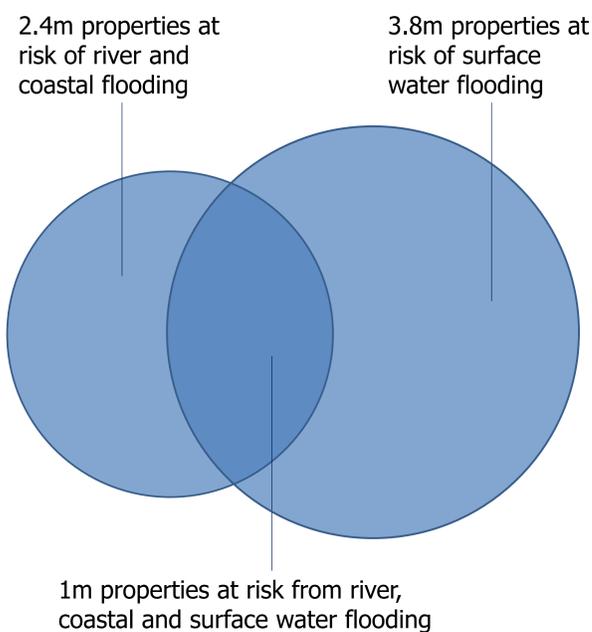


Figure 1. Flood risk in England (Environment Agency, 2009)

Table 1. Future increases in sewer flow volumes (UKWIR, 2010)

Pressure	Increase
<b>Climate change</b> (50 <sup>th</sup> percentile, medium emissions, 2040s)	27%
<b>Urban creep</b> (Current trends extrapolated to 2033)	11.5%
<b>Population growth</b> (run off limited to green field rates to 2033)	4.8%
<b>Total</b>	<b>51%</b>

## TRADITIONAL SURFACE WATER MANAGEMENT APPROACHES

The traditional approach to manage surface water flooding is to build bigger underground pipes and storage. The costs associated with this approach are high; the average cost per property to fix a sewer flooding problem is £200,000 (Environment Agency, 2011). If flood risk escalates as expected, these costs will quickly become unsustainable.

So, the water industry in the UK is aiming to make use of more sustainable alternatives to manage surface water. Two of the key approaches are sustainable drainage systems (SuDS) and designing for exceedance.



Figure 2. Large underground sewer

## SUSTAINABLE DRAINAGE SYSTEMS

Sustainable Drainage Systems (SuDS) aim to manage surface water at source. One of the key challenges is that not enough is known about the multiple benefits of SuDS and how they can be valued.



Figure 3. SuDS scheme at Upton

## DESIGNING FOR EXCEEDANCE

Designing for exceedance is about engineering the urban environment so that surface water flows through it safely and is stored in low risk areas. Despite this approach existing for some time uptake has been low. The challenge here is how to encourage wider uptake.



Figure 4. Road designed for exceedance flows with stepping stones

## INITIAL FINDINGS

When implementing SuDS, practitioners do try to account for wider benefits beyond flood risk management and pollution control. Valuing these wider benefits more accurately would make SuDS more financially attractive and would help attract a wider range of funders, increasing the uptake of SuDS.

Generally practitioners try to design for exceedance, but some are unaware of existing guidance. Case studies and illustrations of good practice would inspire practitioners to implement more exceedance measures. Better tools and data are needed to help identify the best technical solutions.

## NEXT STEPS

Our aim is to produce better tools and guidance based on evidence from existing case studies. We are seeking help from colleagues in the UK and internationally to help gather case studies. Ideally case studies will demonstrate innovative approaches to managing surface water and will include an assessment of the costs and full range of benefits.

If you can help please contact:

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## References

- Environment Agency (2009), Investing for the future, 2009, Bristol, UK.
- Environment Agency (2011), The national flood and coastal erosion risk management strategy for England, 2011, Bristol, UK.
- UKWIR (2010), Impact of Urban Creep on Sewerage Systems. Mott MacDonald, Research Report 10/WM/07/14.