Strategic Flood Risk Assessment

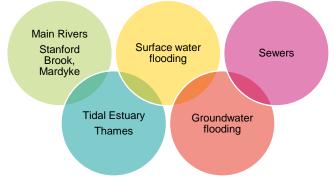
Sarah Littlewood

AECOM

National Planning Policy Framework Section 14

Plans and strategic policies should be informed by a **Strategic Flood Risk Assessment**:

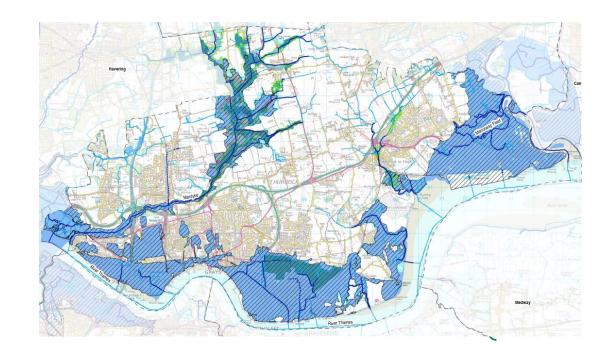
- all sources of flooding
- gumulative impacts in areas susceptible to flooding
- mmpacts of climate change
- land that needs to be safeguarded for future flood risk management (FRM)
- opportunities to reduce the causes and impacts of flooding (green infrastructure, natural flood management (NFM)
- locations where climate change could increase flood risk so that development may not be sustainable in the long term



Flooding from sea/estuary: Thames Estuary

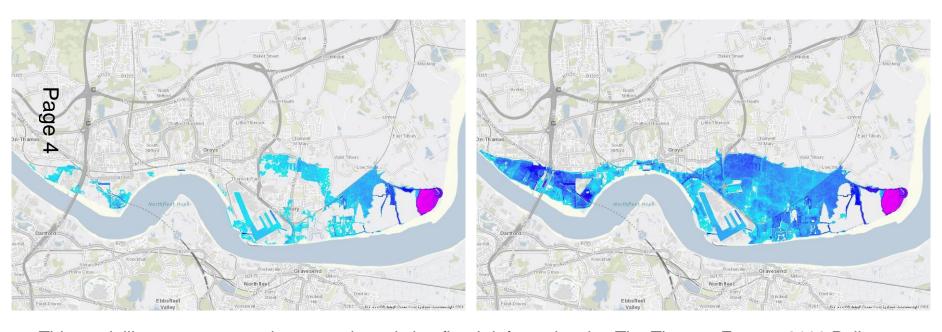
- Large areas of Flood Zone 3

 'high probability' of flooding.
 *doesn't account for defences
- Shown to benefit from **defences**.
- ຣູດ, what is the risk? ຈີ Risk of **overtopping** of the ຜ defences in the future due to climate change
 - 'Residual' risk of breach in defence



Flooding from sea/estuary: Risk from overtopping

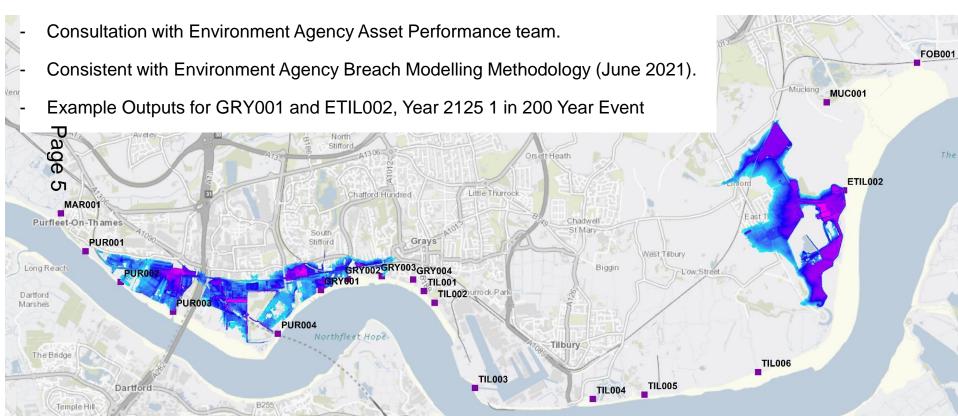
- Example Outputs, Year 2125, 1 in 200 Year Event
- Example Outputs, Year 2125, 1 in 1000 Year Event



- This modelling assumes no change to the existing flood defence levels. The Thames Estuary 2100 Policy most of the Thurrock frontage is to improve defences in line with climate change. Therefore, this provides a conservative understanding of the risk, should defences remain as they are.

Flooding from sea/estuary: Residual risk of a breach in Thames defences

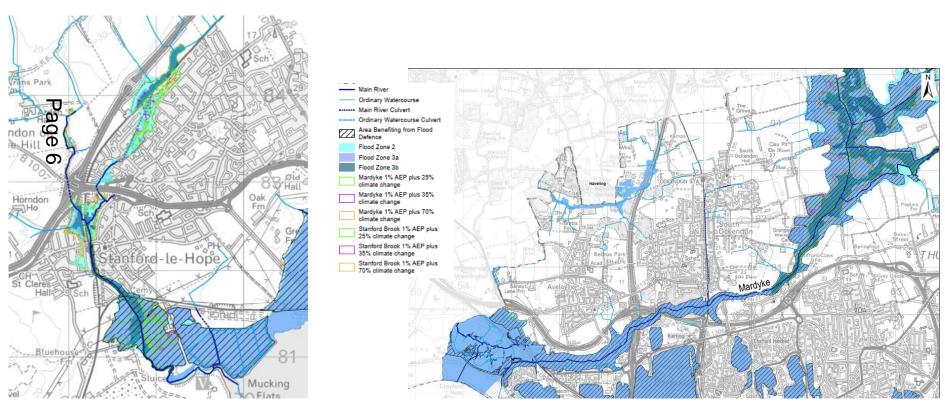
- 21 Breach locations



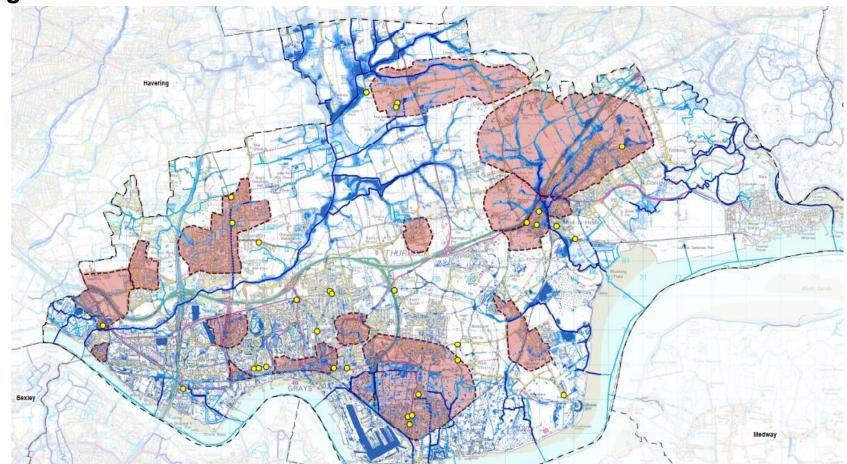
Flooding from rivers: Mardyke, Stanford Brook

Hydraulic models, latest climate change allowances.

Additional sensitivity analysis study for Mardyke model, to determine potential for cumulative impact of development on flood risk.



Flooding from surface water

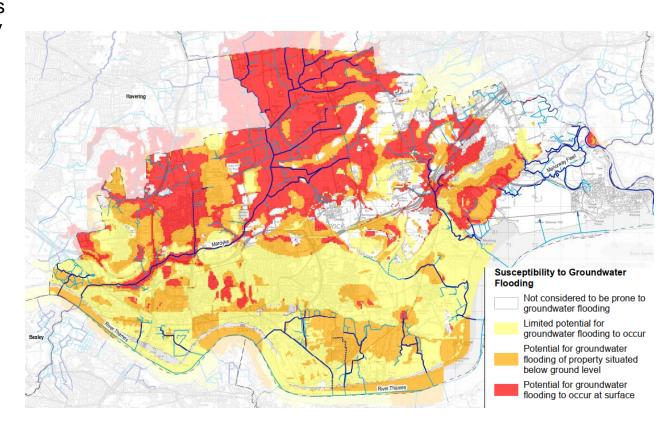


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Flooding from groundwater

- BGS dataset which provides an overview of susceptibility to groundwater flooding.
- Can be used in connection wonth historical records to anderstand risk.

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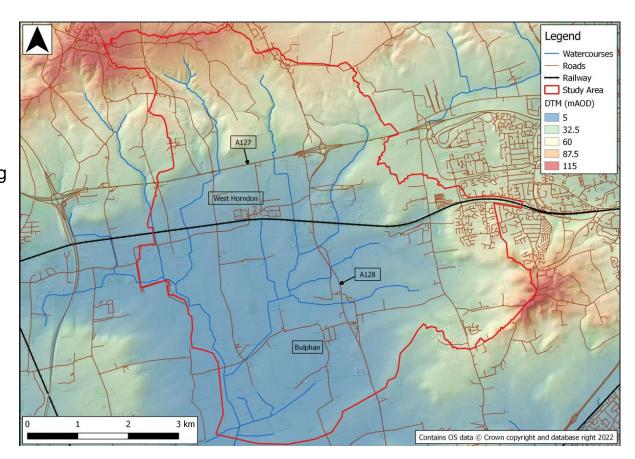


Local Study: West Horndon

- Interconnected sources of flooding (surface water, sewers, river)
- Integrated Catchment Model
- High level assessment of potential cumulative impact of multiple development sites
- Sensitivity of catchment and existing flabding to future development

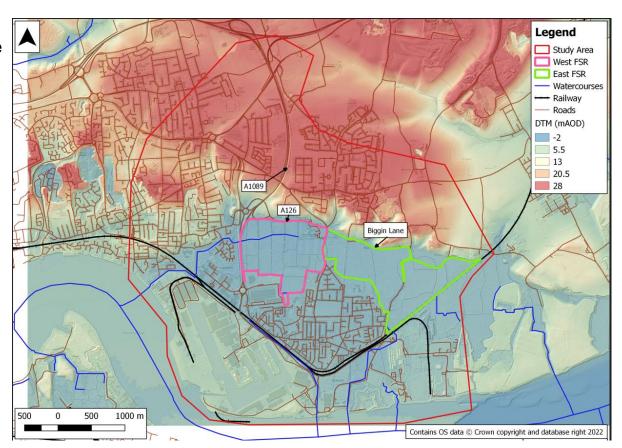
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Local Study: Tilbury

- Interconnected sources of flooding (surface water, sewers, flood storage areas)
- Integrated Catchment Model
- High level assessment of potential cymulative impact of multiple development sites
- Sensitivity of catchment and existing flooding to future development



Development management considerations

Appropriate development types

Sequential approach to site layout

Flood resilient design

Emergency plans

Safe access/escape

Safe refuge



Policy recommendations

Types and location of development

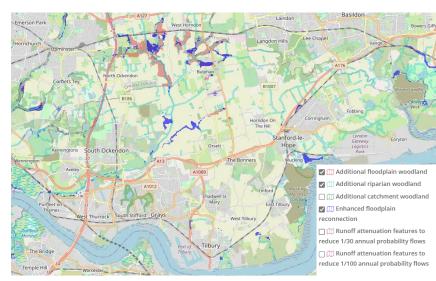
Land that needs to be safeguarded for FRM; set back distances

Magagement of surface water runoff

Development management

Emergency planning

Opportunities to reduce the causes and impacts of flooding through green infrastructure – working with natural processes.



Screen shot from: https://naturalprocesses.jbahosting.com/Map



Tool for Thurrock Council: Site Assessment Database

Data to enable Thurrock Council to undertake Sequential Test process.

Α	В	С	D	E	F	G	Н	1	J	K	L	М	N	0	P	Q	R	S	Т	U	V
										Proportion of Site	Proportio	Proportio			Proportio n of Site		Proportion of Site		Proportion of Site	Number of	
						Initial DRAFT	Proportio	Proportio	Proportio	within	n of Site	n of Site	within	within	within	within	within	within	overlapping	flooding	
						ranking **NB Refer to Notes in Cell 48	n of Site within	n of Site		3.3% AEP for	within 3.3% AEP				Mardyke 70%	Stanford 25%	Stanford 35%	Stanford 70%	"Area	incidents	s
								within											Benefitting	within	Flood
		_				of the 'Datasets'	Flood	Flood	Flood	Stanford	for	Storage				Climate		Climate	from Flood	500m of	Warn
	Site Name	S ▼	Thurrock Site Number 💌		Area (H ▼	Tab** ▼	Zone 1 ▼	Zone 2 💌	Zone 3a ▼	Brook 💌	Mardyl *	Area 💌	Change ▼	Change *	Change *	Change *	Change *	Change *	Defence" 💌	the Sit∈ ▼	_
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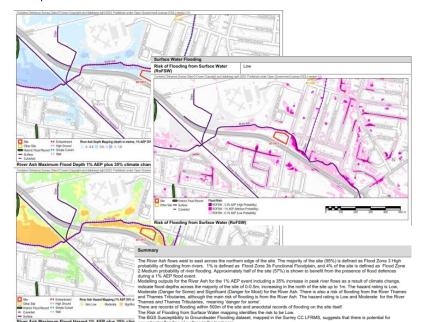
Level 2 SFRA Site Assessments

Some sites in Thurrock will require application of the Exception Test, e.g., any residential development proposed in Flood Zone 3.

NP para. 164: 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.

Example extracts of a Level 2 SFRA Site Assessment Sheet:



e Specific Recommendations

New development is not permitted in areas of Flood Zone 3b Functional Floodplain. This part of the site should be retained as floodplain and steps taken to restore the land to provide a more natural floodplain for the River Ash.

Residential development is defined as More Vulnerable and is only permitted in Flood Zone 3 where it can be demonstrated that the Exception Test is satisfied i.e. (1) that the proposed development will provide visit outside job for such as a facility of the user, without increasing flood from the proposed development will provide visit outside job for such as a facility of the user, without increasing flood from the proposed development of the vulnerability of its user, without increasing flood from the proposed development of the proposed development of

 There is built development on the existing site. In order to ensure that future development does not increase the risk of looding, the built footprint of new development of the site should not exceed that of the existing building and where possible should be reduced. Finished floor levels for residential accommodation must be set above the design flood level (1% AEP including climate

 Safe access/egress (i.e. that is dry or Low hazard during the 1% AEP event including climate change) to an area at low risk of flooding is likely to be achievable south along Woodthorpe Road.

The site is located within the Flood Warning Areas for the River Ash (River Ash at Ashford and Staines) and the River Thames at Staines and Egham). Emergency Plans would need to be developed for occupants of the site to set out the response the event of a flooding warning.

 Development proposals for the site should seek to restrict surface water runoff rates to greenfield rates; demonstrate sustainable approaches to the management of surface water making use of SuDS including green roofs, rainwater harvesting and other innovative technologies; and incorporate soft landscaping, planting and permeable surfacing.

 A preliminary Hydrogeological Risk Assessment (HRA) should be undertaken to determine ground conditions and groundwater levels in proximity to the site, and to identify whether the proposed development will impact on groundwater, either from subsurface construction or from changes to surface water drainage. Should the preliminary HRA identify potential for impact, a full HRA should be prepared to identify proposed mitigation measures. Refer to Section 5.7 in the Level 1 SFRA Record.

Summary: Considering flood risk in plan making and site selection

Update Flood Risk Evidence
Base

Apply **Sequential Test** to Sites

Are sites at medium or high risk of flooding required to meet targets?

Undertake Level 2 Site Assessment work, to inform **Exception Test**

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Strategic Flood Risk
Assessment (AECOM)

- Site Assessment Database (AECOM)
- Document Sequential Test Process & Decisions (Thurrock Council)
- Outcome from Site Selection Decisions (Thurrock Council)
- Level 2 SFRA Site
 Assessments to inform part
 (2) of the Exception Test
 (AECOM)



LURB NPPF Proposed Amendments

- ☐ Minor modification to the presumption in favour
- Removal of the justified test of soundness
- Additional text relating to Green Belt
- Emphasis on design has been strengthened further,
- with a focus on 'beautiful design' throughout and the requirement for LPAs to bring forward design codes for their area
- ☐ Greater weight to energy efficiency improvements in existing buildings and there is also increased support for applications for the repowering and life-extension of existing renewable sites.

'Green Belt boundaries are not required to be reviewed and altered if this would be the only means of meeting the objectively assessed need for housing over the plan period.'