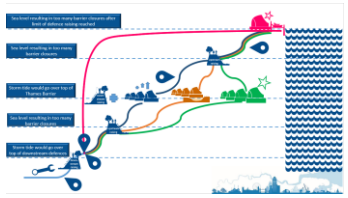
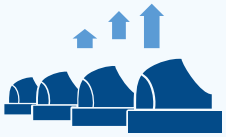
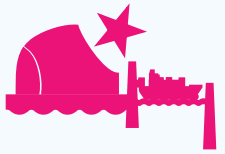


Presentation 2, slide 18

Adaptation pathways starter pack: fact sheet 4

An adaptation pathway in action: options and thresholds

All of the options in the Plan start by maintaining and improving the current flood defence system, then raising the downstream defences before water levels reach the 1st threshold. A choice between options will be needed when the next threshold level is approaching.

	1. Barrier improvements	2. Barrier + flood storage	3. New barrier	4. Barrier with locks
Option				
Detail	• Raise upstream defences • Major improvements to existing Thames Barrier to increase its height • While improvements are being carried out, over-rotate existing Thames Barrier – adjust the height settings of the barrier gates to manage marginally higher storm tides	• Raise upstream defences • Over-rotate existing Thames Barrier • Create tidal flood storage areas at 4 sites (Erith, Aveley, Dartford/Crayford, Shorne Marshes) • Flood storage reduces level of storm tides, prolonging life of existing Thames Barrier • Raise downriver defences and improve existing Thames Barrier or build a new barrier, at a later date than other options	• Raise upstream defences • New barrier at Tilbury or Long Reach, downstream of the existing site • Locations have a straight approach of 1 km for ships to align themselves to pass through the barrier • New barrier closes for storm tides and remains open on normal high tides, like the existing barrier • Potentially lower defences between old and new barriers – original downstream defences become upstream defences	• Located at Tilbury, Long Reach or existing site • Upstream defence raising is not required - barrier is designed to close for high tides as well as storm tides • 2nd set of tidal gates acts as a back-up, allowing closures as often as needed without losing reliability • Locks allow the passage of boats during more frequent closures • Potential to lower defences between old and new barrier sites

Where to find out more: Thames Estuary 2100 Plan – Chapter 5, pages 35 - 38

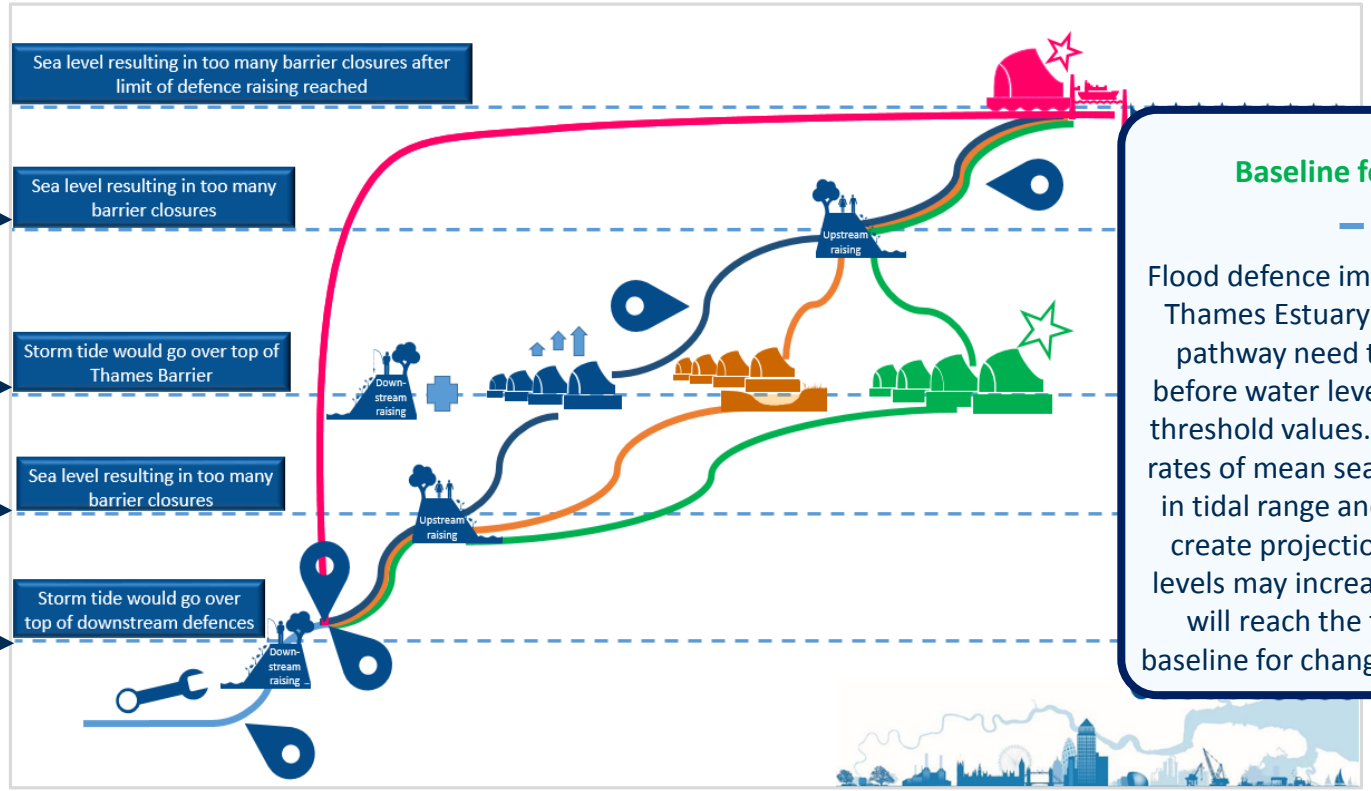
Thresholds

Annual average of 50 closures of the Thames Barrier

0.1% AEP water level at Thames Barrier exceeds 6.5 mAOD

Annual average of 50 closures of the Thames Barrier

0.1% AEP water level at Southend-on-Sea exceeds 5.24m AOD



Baseline for thresholds

Flood defence improvements in the Thames Estuary 2100 adaptation pathway need to be completed before water levels reach specified threshold values. The Plan uses the rates of mean sea level rise, change in tidal range and other factors to create projections of how water levels may increase and when they will reach the thresholds. The baseline for change is the year 2005.

Raising downstream defences

Future Thames Barrier

The downstream defences will be raised in 2 stages. Defences will be raised by 0.3 m or 0.6 m (depending on location) in the 1st stage, and new defences will be built at Gravesend. The threshold is when the 0.1% annual exceedance probability water level* (AEP) at Southend-on-Sea exceeds 5.24 m AOD (meters above Ordnance datum).

The threshold for implementation of the future Thames Barrier, and the 2nd stage of downstream defence raising, is when the 0.1% AEP water level at the barrier exceeds 6.5 m AOD. The defences will be raised by another 1-1.5 m in this stage.

* Water level where probability of a flood reaching/exceeding that level is 0.1% in any year.

Raising upstream defences

The thresholds for raising upstream defences are 50 closures of the Thames Barrier per year on average. More closures are not sustainable because of the need for maintenance and reliability. Projections of future closure numbers are based on models of climate change and operational changes.

The height of upstream defences will be raised by 0.5 m in each of 2 phases, resulting in a total of 1 m of raising. Raising upstream defences is accompanied by changes to the rules for closure of the Thames Barrier, to allow higher tides upriver and thus reduce the number of times the barrier needs to close.