The Thames Barrier: London's Moveable Flood Defense

Alexander Hall

Summary

The Thames Barrier is a moveable flood defence located on the River Thames, downstream of central London in the United Kingdom. Built to protect the densely populated floodplains to the west from floods associated with exceptionally high tides and storm surges, the barrier consists of flood gates that are closed when exceptionally high water levels are forecast. Under construction from 1975 and becoming operational in 1982, the barrier was built in response to repeated floods along the Thames and in London, most notably in 1928 and 1953.

The Thames Barrier is a moveable flood defense located on the River Thames, downstream of central London in the United Kingdom. Spanning a cross section of the river 520 meters wide, the barrier is the second longest movable flood barrier in the world, after the Netherlands' Oosterscheldekering (Eastern Scheldt storm surge barrier). Operational since 1982, the Thames Barrier was built to protect the densely populated floodplains to the west from floods associated with exceptionally high tides and storm surges.



River Thames in Flood near Marlow

Photo by Wayland Smith
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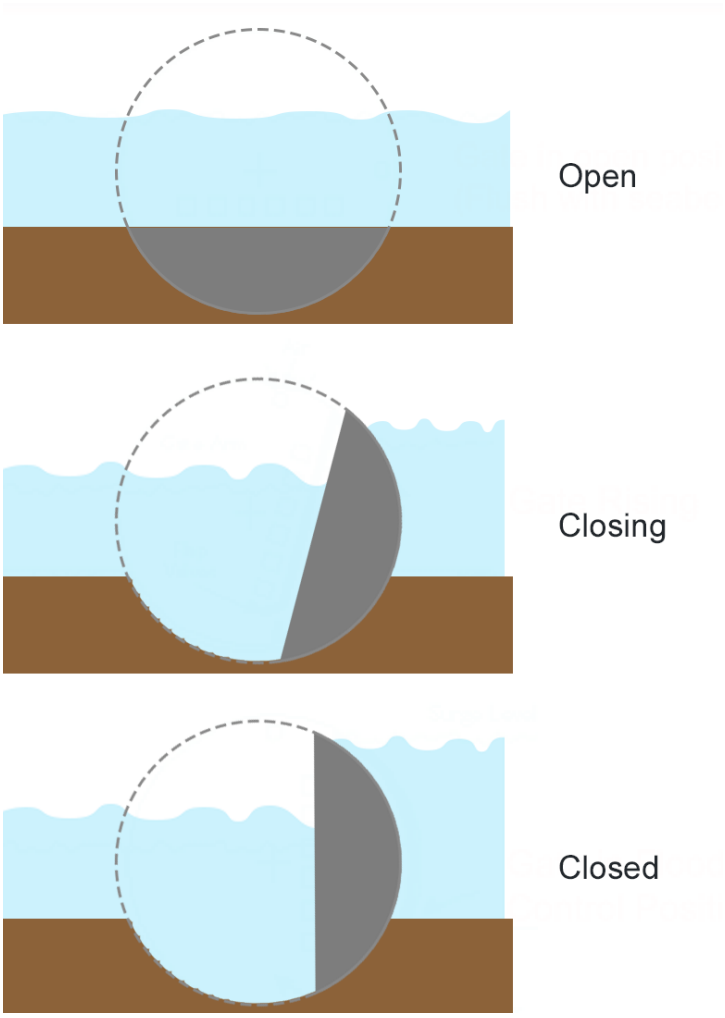


The Thames Flood Barrier

Photo by Paul Farmer.

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A simple cross-sectional diagram showing how the six rising sector flood gates of the barrier operate

Trolleymusic 2012

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The barrier divides the river channel into ten individual flood gates. Four of the gates sit above the river and make the outer sections non-navigable, whilst the six larger, central rising sector gates lie flat on the river bed and are only raised when an exceptional tide is expected, allowing river traffic to pass unimpeded. The rising gates use a unique rotating concept, with each gate comprising a circular segment in cross section made of hollow steel that fills with water, with the whole barrier taking approximately one and a half hours to close. For more information, see the below animation.

When construction on the barrier began in 1975, the idea of a barrier or dam across the River Thames to protect the population of London from flooding had already been discussed for several decades. The first impetus for modern flood-control defenses along the River Thames came after the disastrous flood of January 1928, which killed fourteen and left thousands homeless in central London. Although there were some calls for a flood

barrier, engineering limitations and the number of large vessels still using the river in 1928 meant the only improvements to flood defenses were along the river's banks.

It was the catastrophic North Sea Flood of late January 1953 that caused over 300 deaths in the UK that eventually led to the barrier's construction. Although London was largely spared from the flooding, the scale of the devastation elsewhere in the country led to a renewed assessment of London's vulnerability to flood. A committee who reviewed the floods recommended that investigations into the possibility of a barrier be undertaken. However, it wasn't until a further review by Sir Herman Bondi in 1967, itself triggered by the devastating floods in Hamburg in 1962 , that serious progress on the proposal happened. The Thames Barrier Act was finally passed in 1972.



The Thames Barrier from the north bank of the river at Silvertown, in normal (open) operation

David Iliff 2010
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With each of the main gates being just over 20 meters high and able to cope with a tidal surge of nearly 10 meters above normal, the Barrier was built to protect London from a 1-in-1000 year flood-level. However, due to changing tidal levels and the slow subsistence of the south-east of England (post-glacial rebound), as predicted during initial planning, the Barrier has had to be raised with increasing frequency. With sea levels predicted to rise further due to anthropogenic climate change and with rising population density in London, it seems likely that the barrier will be increasingly called into action until it is due to be replaced around 2060.

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Further readings:

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- Hall, Alexander, "The Rise of Blame and Recreancy in the United Kingdom: A Cultural, Political and Scientific Autopsy of the North Sea Flood of 1953." in *Environment and History* 17 (2011): 379-408.
- Horner, Ray, "The Thames tidal flood risk—the need for the barrier: a review of its design and construction." *Quarterly Journal of Engineering Geology and Hydrogeology* 17 (1984): 199-206

Related links:

- Thames Barrier information (Accessed 10 October 2014) https://www.gov.uk/guidance/the-thames-barrier

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Websites linked in this text:

- https://www.environmentandsociety.org/arcadia/north-sea-flood-1953
- https://www.environmentandsociety.org/arcadia/great-flood-1962-hamburg

Websites linked in image captions:

- http://www.geograph.org.uk/profile/79472
- https://it.wikipedia.org/wiki/File:Thames_Barrier_-_simple_operation_diagram.png
- https://en.wikipedia.org/wiki/Wikipedia:Wikipedia_Signpost/Single/2011-08-29#/media/File:Thames_Barrier,_London,_England_-_Feb_2010.jpg

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Alexander Hall is a historian interested in the intersection of science, policy, and the environment, and is currently a visiting scholar at the Institute for Science and Technology Studies at York University, Toronto. He recently obtained his PhD from the Centre for History of Science, Technology, and Medicine at the University of Manchester.

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