

Flooding of the River Thames in 2014

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Synopsis

This **Geofile** is a case study of the 2014 floods at Wraysbury and Staines-upon-Thames. The winter storms of 2014 left more than 5000 homes and businesses flooded, with many rivers across southern England reaching their highest-ever recorded levels. There have been several major flood events along the Thames in the past, but 2014 saw river flows in the Thames considerably higher than at any time since 1974. The recent flooding of the Thames at Wraysbury and Staines-upon-Thames was further compounded by the creation of an artificial hydraulic channel and resulted in thousands of people having to flee their homes as the water levels rose, causing widespread damage.

Key terms

river, flood, channel, insurance, people, water, homes, groundwater

Learning objectives

By working through this unit you will improve your understanding of:

- both the physical and human causes of flooding of the River Thames in 2014 in England, as an example from an MEDC
- the impact of the flooding on the people who live close to the River Thames in Surrey
- the flood management strategies that are being introduced along the River Thames to try and reduce the future risk of flooding.

Exam Board	Link to specification
AQA	Unit 1, GEOG1 Physical and Human Geography, Core Physical Section, Rivers, floods and management, see page 20 http://filestore.aqa.org.uk/subjects/specifications/alevel/AQA-2030-W-SP-14.PDF
Edexcel	Unit 1, Global Challenges, Topic 1: World at Risk, see pages 17–21 and 25; Unit 2, Geographical Investigations, Topic 1: Extreme Weather, see pages 33–35 http://www.edexcel.com/migrationdocuments/GCE%20New%20GCE/UA035234_GCE_Lin_Geog_Issue_4.pdf
OCR	AS Unit F761: Managing Physical Environments, River Environments, see pages 11 -12; A2 Unit F763: Global Issues, 'What are the hazards associated with flooding?', see page 30 http://www.ocr.org.uk/Images/69036-specification.pdf
WJEC	Unit G1, Changing Physical Environments, Theme 2, Investigating Tectonic and Hydrological change, see page 21; Theme 4, Development, see page 36 http://www.wjec.co.uk/uploads/publications/6312.pdf
CCEA	Unit AS 1: Physical Geography, Section A, Mid-latitude Weather Systems, see page 12 http://www.rewardinglearning.org.uk/qualifications/results.aspx?g=1&t=1&c=R&s=0&v=0&f=0&q=182&d=d
CIE	Paper 1: Core Geography, Physical Core, Hydrology and Fluvial Geomorphology, see page 17; Paper 2: Advanced Physical Geography Options, Hazardous Environments, see page 22 http://www.cie.org.uk/images/164517-2016-syllabus.pdf
International Baccalaureate	Geography Diploma Programme, Paper 2, Optional Themes, Freshwater – Issues and Conflicts http://ibgeog2009.wikispaces.com/Freshwater

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The wettest winter on record

The winter of 2013/14 was notable for being very mild. Temperatures in the South of England rarely fell below freezing, but this was countered by the fact that it was an incredibly wet winter, indeed the wettest since records began in 1910. According to the Meteorological Office, the UK received 486.8mm of rain between 1 December 2013 and 19 February 2014, surpassing the previous record of 485.1mm of rain set in 1995. The cause of this heavy rainfall was a series of storms rolling across the Atlantic that lashed the UK with heavy rain, resulting in winter storms that caused widespread flooding.

The winter started badly when St Jude's Storm hit the UK at the end of October 2013. The storm battered Britain with heavy rain and wind speeds of up to 80 mph, causing four deaths, loss of power for over 600,000 people, and a large number of train and flight cancellations. The disruption and chaos caused by the storm seemed to be more akin to a freak weather system, but as the winter progressed, it was clear to see that it was only the beginning of a progression of storms that were to wreak havoc across the country.

The River Thames at Wraysbury and Staines

The River Thames has its source in the Cotswolds, and then proceeds to travel for 236 miles through some of England's most picturesque towns, right into the centre of London and eventually out into the North Sea. It is the longest river wholly in England, and drains the entire Greater London area. There have been several major flood

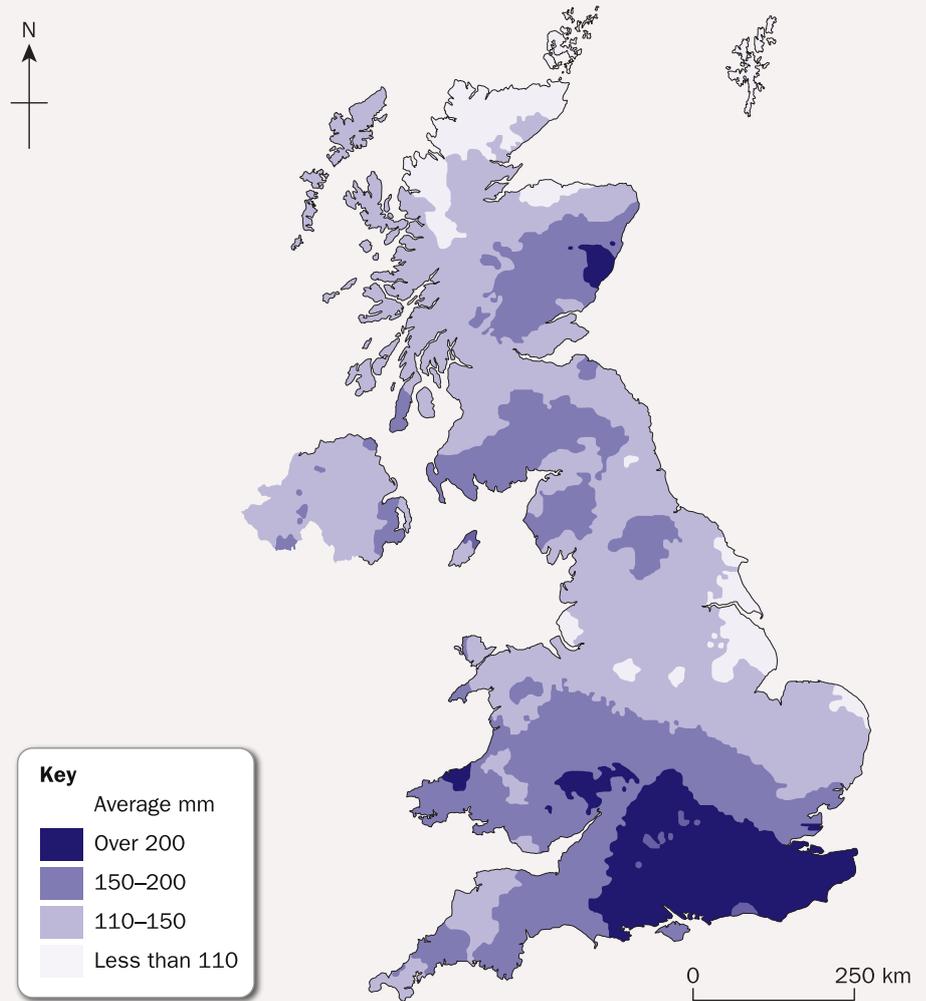


Figure 1 The UK's wettest winter on record: rainfall Dec 2013–Feb 2014 as % of 1981–2010 average

Source: Met Office Data

events along the Thames in the past, including the 1947 flood which affected much of the Thames Valley during March of that year following a severe winter. The 1947 floods were caused by 117 mm of rainfall, with a peak flow of 61.7 billion litres of water per day. The resulting damage cost more than £12 million to repair.

Wraysbury is a village on the River Thames, about midway between Windsor and Staines-upon-Thames (Figure 2), with a population of about 3500 people. It is a picturesque village, centred around a traditional cricket green, with many people commuting to work in London. Staines is a much larger town, with a population of just



Figure 2 The River Thames

over 25,000. The town has developed on both sides of the river since Roman times and today many businesses still have riverside properties. The town hosts a number of major companies, including BUPA, Siemens and Samsung.

Physical causes of the February 2014 floods

Like much of the preceding two months in the South East of England, February was exceptionally wet, with twice the average monthly rainfall. South East and central southern England had 268% of the average rainfall! The first half of the month saw a succession of major winter storms bringing strong winds and heavy rain. However, despite some brief sunny spells, the rain continued, with few dry days, resulting in a build-up of groundwater and pushing many local rivers and streams close to bursting point. This rainfall continued on top of an exceptionally wet previous four months, which had seen

groundwater levels rise considerably. The ground was sodden and the continued rainfall had nowhere to go. Flows in the River Thames were by now very high, and at the beginning of February the lower reaches of the River Thames flows reached their highest point since 1974.

By 9 February, it was clear that the Thames could not cope with the amount of water it was expected to drain, and 14 severe flood alerts were issued along its banks in Berkshire and Surrey, with clear warnings that both people and property were at risk (Figure 3).

How human factors contributed: the role of the Jubilee River

The recent flooding of the River Thames at Wrybury and Staines was further compounded by the creation of an artificial hydraulic channel specifically designed to reduce flooding along the Thames. The 'Jubilee River' (named in honour of the Queen's Golden Jubilee in 2002) was constructed in the late 1990s and early 2000s to take overflow from the River

Thames in order to alleviate flooding of areas in and around the towns of Maidenhead, Windsor and Eton. It is the UK's biggest man-made river and cost over £110 million.

The Jubilee channel works by diverting water from the River Thames upstream of Boulter's Lock near Maidenhead. The water is diverted into a 7.2-mile straightened channel, rather than meandering along a 15-mile stretch of the Thames as it passes Windsor and Eton. The channel returns the water to the Thames further downstream at Datchet. This has the effect of lowering the river level upstream as it passes Windsor and Eton, by sending the water straight towards Datchet. The problem that occurred with this is that because the Jubilee route is shorter and faster than the Thames, it rejoined the main river before the water levels had been able to subside at Datchet, Wrybury and Staines.

By early February 2014, the Jubilee River had been running at full capacity for over a month and, coupled with the continual rainfall

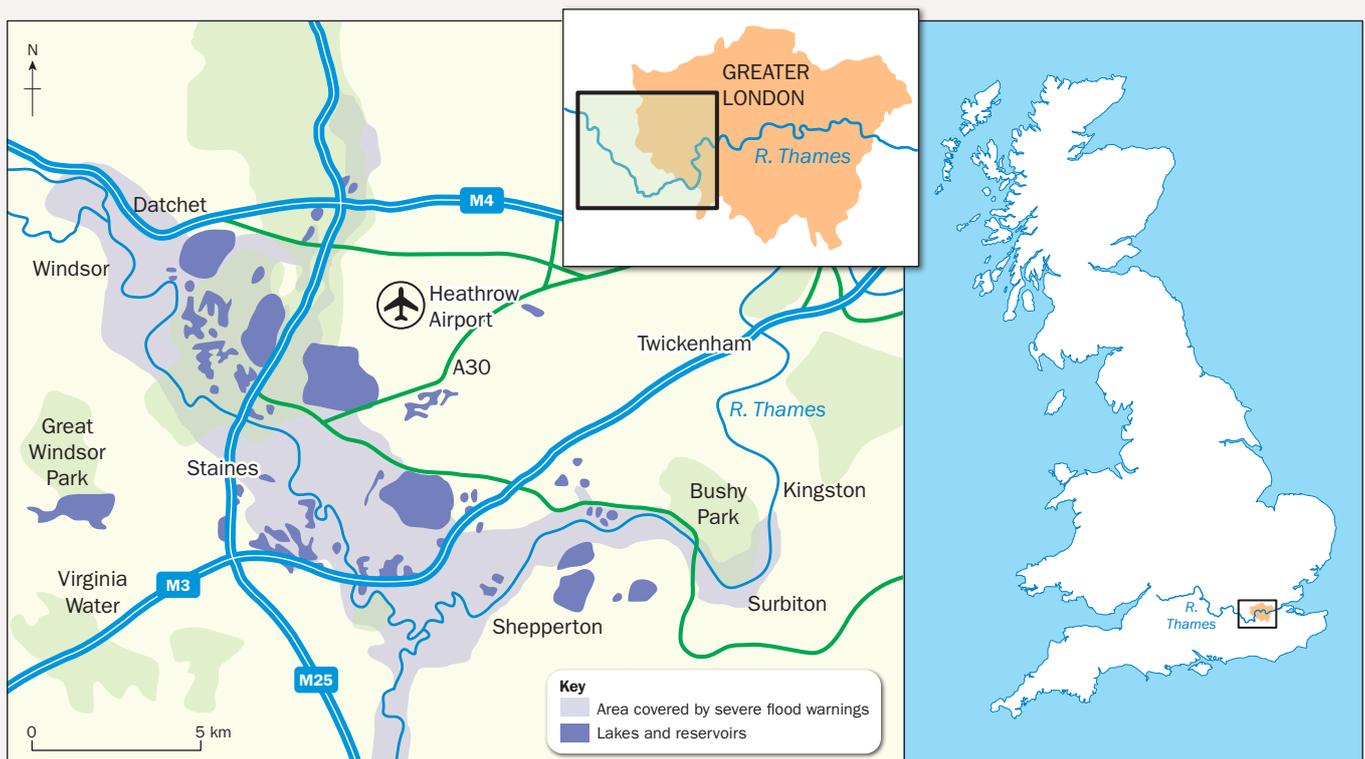


Figure 3 Area of severe flood warnings on 9 February 2014



Figure 4 The flood waters at Thorpe near Staines

Source: Tommy Young

throughout early February, it seemed inevitable that problems would occur. By early morning on 10 February much of Wraysbury was completely engulfed by water, whilst Datchet had been severely hit by flooding with water levels rising over half a metre in 24 hours, blocking roads and railway lines. Many parts of Staines fared little better, with the river bursting its banks and sending floodwater into many parts of the town, forcing people to evacuate their homes.

Impact of the 2014 floods

Flooding occurred on both banks of the Thames, from Datchet down to Shepperton, including a large swathe of Staines, Egham and parts of Chertsey and Laleham. People living in Staines were woken by telephone flood alerts as the Thames burst its banks and began to flood land on either side (Figure 4). Many Thames islands, such as Hamhaugh Island and Sunbury Court Island, saw homes flooded and cut off.

It is estimated that over 1000 homes on or by the River Thames had to be evacuated and a further

2500 were at risk of flooding. Surrey Police declared a 'major incident' and deployed more than 100 officers to the area. The force said it had been overwhelmed with 999 calls overnight, and urged people only to call in an emergency. Around 30,000 sandbags were deployed in Datchet, Old Windsor, Horton, Wraysbury and Cookham in Berkshire to try and prevent further flooding to properties.

Fire crews had to rescue many people from their homes in Staines, commenting that they had never known waters so deep, or a flood rescue operation on this scale.

Surrey Police confirmed that more than 150 people had been rescued from flooded homes in a 24-hour period.

The village of Wraysbury was targeted by looters after many homes were evacuated by residents due to the rising waters. Local councilors urged the police and Army to take control of the situation, which finally prompted the government into action more than 48 hours later. Soldiers from the Royal Regiment of Fusiliers based at Tidworth in Wiltshire began to arrive on 11 February

with orders to help deploy sandbags and support the police in maintaining law and order. The soldiers pitched a command tent in a field next to the village school playground and proceeded to help with the evacuation of vulnerable people who were trapped in their flooded homes, as well as delivering sandbags and medicine. Even Princes William and Harry gave their time to help local residents and pile sandbags in the village of Datchet.

For many residents, help arrived too late. Many homes were already flooded, power was cut off and the damage done. People moved possessions upstairs where they could and waited until the flood began to subside. Sandbags are of little use once a house has flooded, and supplies of food and drinking water were many people's highest priority. This often meant travelling by boat, or using waders to make contact with the outside world.

The cost of clearing up the Thames flooding disaster is thought to have been in excess of £500 million, with much of this cost borne by the insurance industry. Damage was sometimes so severe that many people had still to return to their homes six months after the event.

Preparing for future flood risks

The aftermath of the 2014 floods saw bitter accusations from affected households, aimed at both the Environment Agency (EA) and at the government. Issues about the Jubilee channel and a lack of dredging along the Thames highlighted a perception that more could have been done to prevent the disaster. Originally, the EA had promised to solve Wraysbury's flood problem by providing it with its own 'Jubilee River', in the form

of the £256 million Lower Thames Flood Relief Scheme which would have provided a 10-mile series of additional flood relief channels, one of which was planned to bypass Wraysbury and Datchet. Unfortunately, this scheme was abandoned in 2010 when the EA could no longer afford to fund the project.

River Thames scheme: reducing flood risk from Datchet to Teddington

Since the floods of early 2014 the government has forced the EA to put a new, revised Thames Flood Scheme plan in place. The new scheme consists of building a new flood channel, making improvements to three of the

existing Thames weirs, installing property-level products for up to 1200 homes (to make them more resistant to floods), and improved flood incident response plans. The planned flood channel would be between 30 and 60 metres wide and 17 km long, built in three sections.

This proposed scheme would protect 9500 properties up to a 1 in 75 (1.33%) chance of a flood occurring in any year. In total around 15,000 properties, local infrastructure (e.g. roads, sewerage network) and many businesses would be better protected from severe flooding. It is hoped that construction work would begin in the summer of 2016, with

modifications to the first Thames weir. Construction of the flood channel is expected to start in 2020. Figure 5 breaks down the financial costs of the Thames Flood Scheme to reduce flooding, which should be completed by 2027.

Managing the cost of flood insurance

Since the 2014 floods, the government has ensured that all properties affected can continue to obtain insurance cover through a special deal between insurers and the government. This is set to change in 2015, under an agreement called Flood Re, which will ensure that a fund is set up in order to provide payouts on properties insurers are unwilling to cover, with the insurance industry paying in the premiums for high-risk properties, plus a levy of £180m a year. People living in flood-prone areas will pay up to £540 extra a year for the flood-insurance element of their cover – but at least it will mean that properties remain insured. The insurance industry estimates that about £350 million a year will be paid into the fund for each of the next five years, although there have been warnings that if the number of large-scale flood events were to continue to rise, this might not be enough.

Item	Flood plain management	Flood channels	Total £m
Environment Agency costs	4	19	23
Construction costs	17	131	149
Environmental compensation/enhancement costs	1	7	8
Land purchase/compensation	1	21	22
50% Optimism bias	12	89	101
Total capital cost (£m)	35	267	302
Future construction costs	4	32	36
Maintenance costs (100 years)	39	161	200
Whole life cash cost (including maintenance, but no inflation)	78	460	538

Figure 5 Summary of whole life costs for the Thames Flood Scheme (£m)

Source: Environment Agency Lower Thames Flood Risk Management Strategy Report

Focus questions

- 1 Study Figure 1 which shows a map of the amount rainfall across the UK between December 2013 and February 2014. Describe the distribution of this rainfall across the UK.
- 2 Explain the physical and human reasons for the flooding of the River Thames in February 2014.
- 3 Comment on the advantages and disadvantages of the current and proposed flood management strategies for the River Thames.

Learning checkpoint

While you're studying this unit, consider the following questions:

- Critically evaluate the responses to the 2014 flooding of the River Thames.
- What, if anything could have been done to alleviate the physical factors contributing to the flooding?
- The Jubilee River was designed to reduce flooding on the Thames. Was it effective?
- Was the design of the Jubilee River fit for purpose?
- How do you think people who had their houses flooded in Wraysbury and Staines felt about the Jubilee River?
- Who should foot the £500 million repair bill?
- Should people who live by rivers be entitled to government support to ensure that they can insure their homes against flooding?
- Will a new channel between Datchett and Teddington that could prevent a 1 in 75 flood be a cost effective solution to flooding in Wraysbury and Staines?
- What do you think should be done to prevent flooding of homes in Wraysbury and Staines in the future?