

# River Mole flooding impacts



Aim: To investigate the impact of the River Mole on the people of Leatherhead

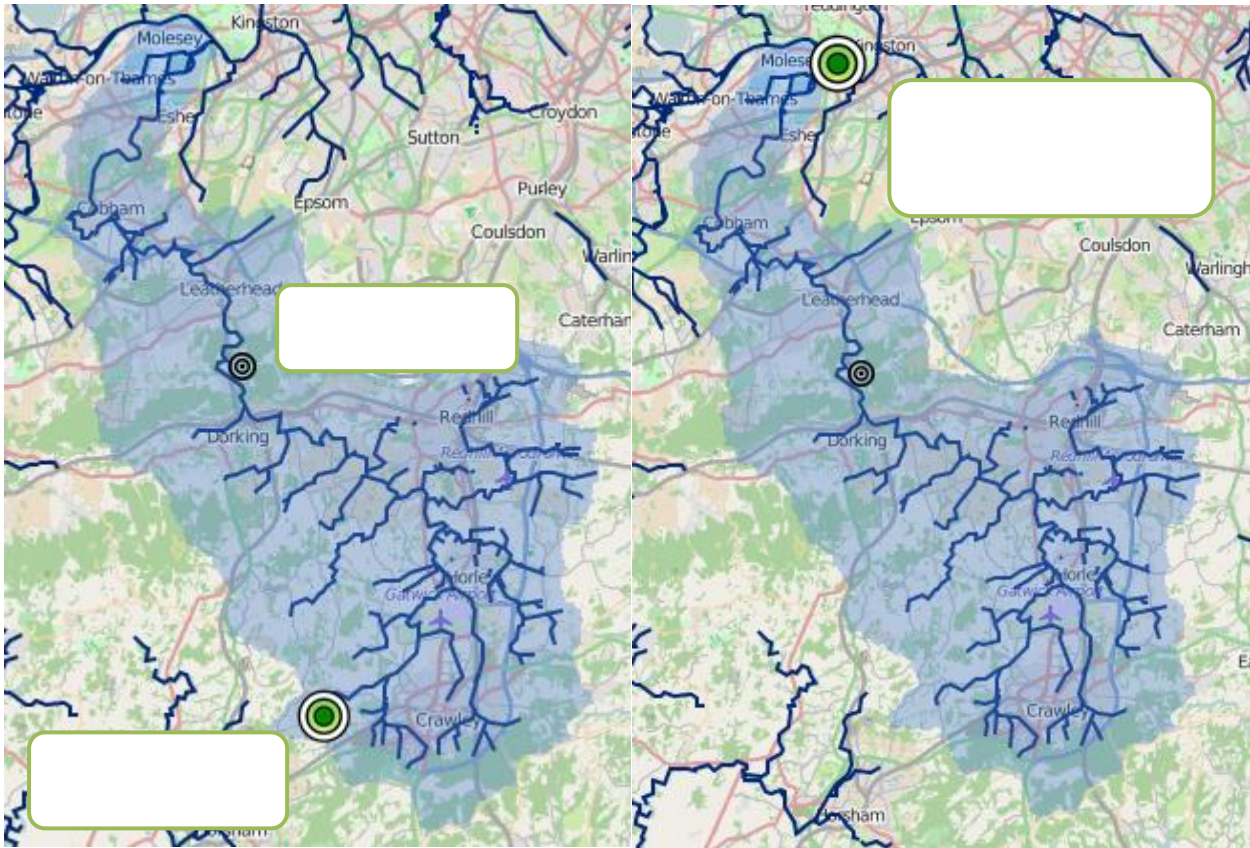
Learning objectives:

- To consider how human and physical factors affect the hydrology of a river catchment.
- To investigate the impacts of flooding in a town.
- To use a range of fieldwork techniques to investigate flood impact.
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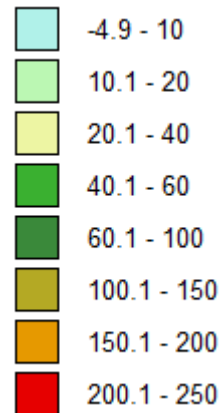
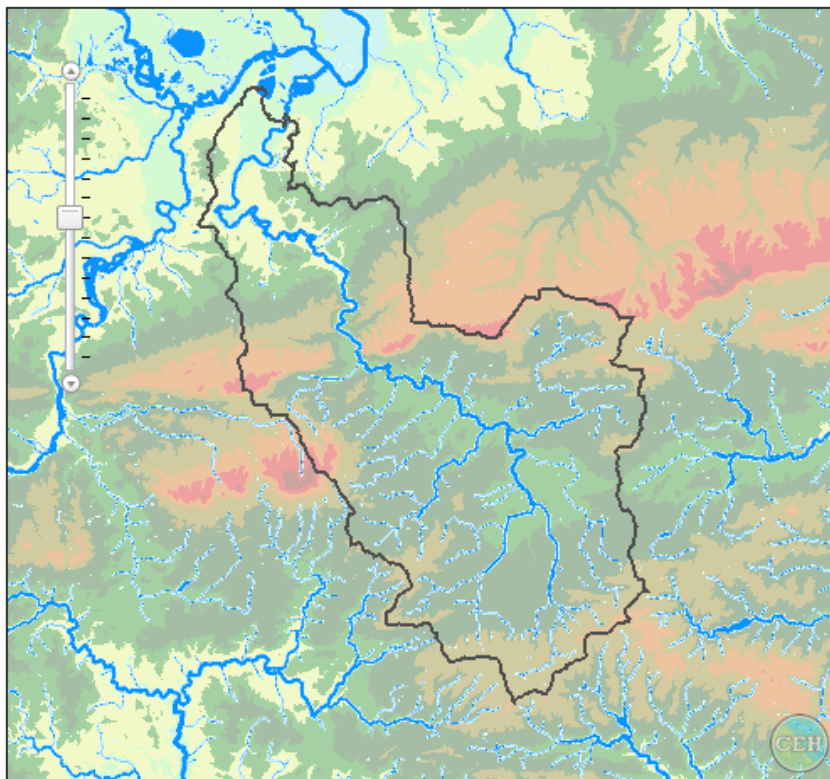
## The river Mole catchment



# River Mole flooding impacts

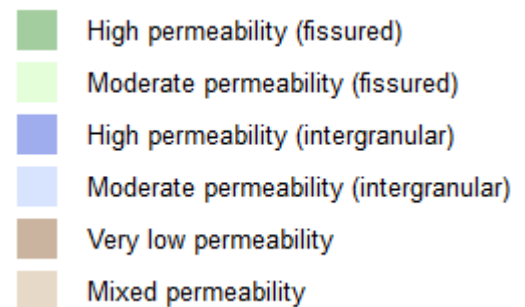
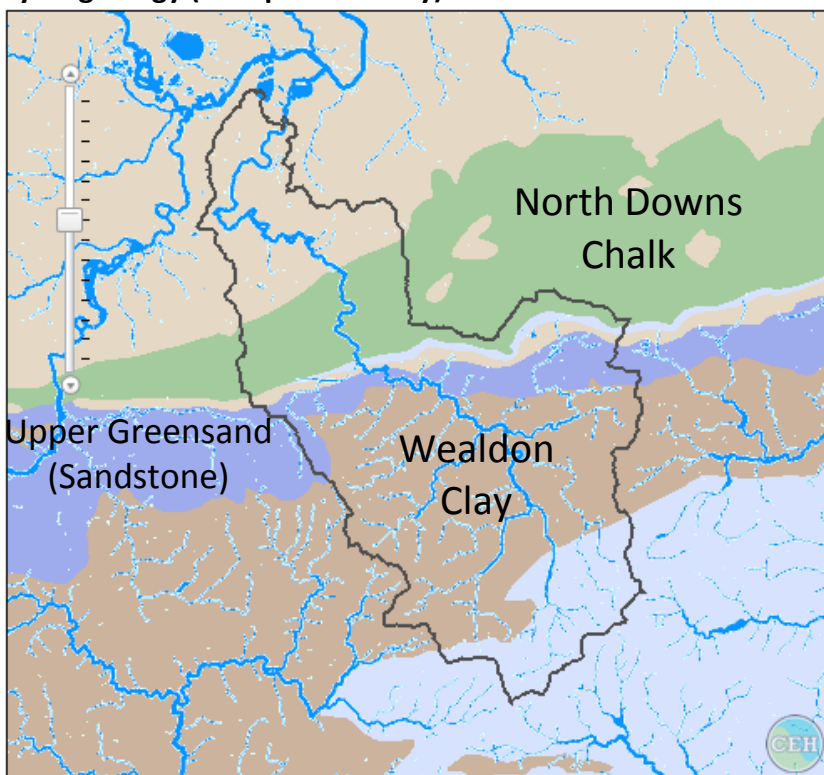
Factors affecting the hydrology of the river Mole catchment

## Catchment elevation



**Minimum Altitude:** 10mAOD  
 (Above Ordnance Datum (mean sea level))  
**Maximum Altitude:** 264.5mAOD

## Hydrogeology (rock permeability)

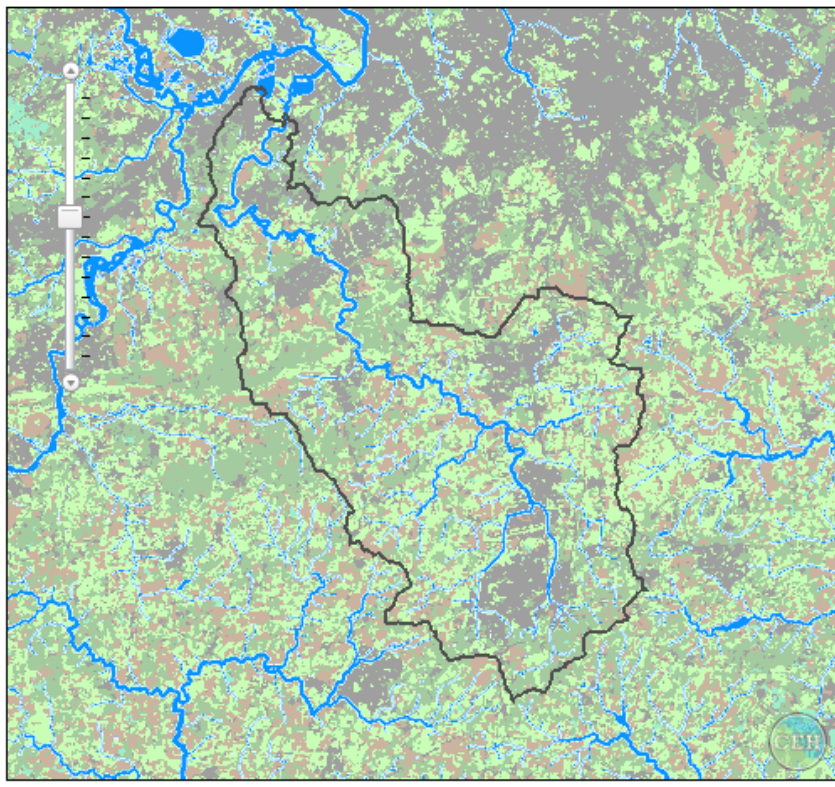


<b>High Permeability Bedrock:</b>	24.0 %
<b>Moderate Permeability Bedrock:</b>	13.3 %
<b>Low Permeability Bedrock:</b>	56.3 %

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Catchme

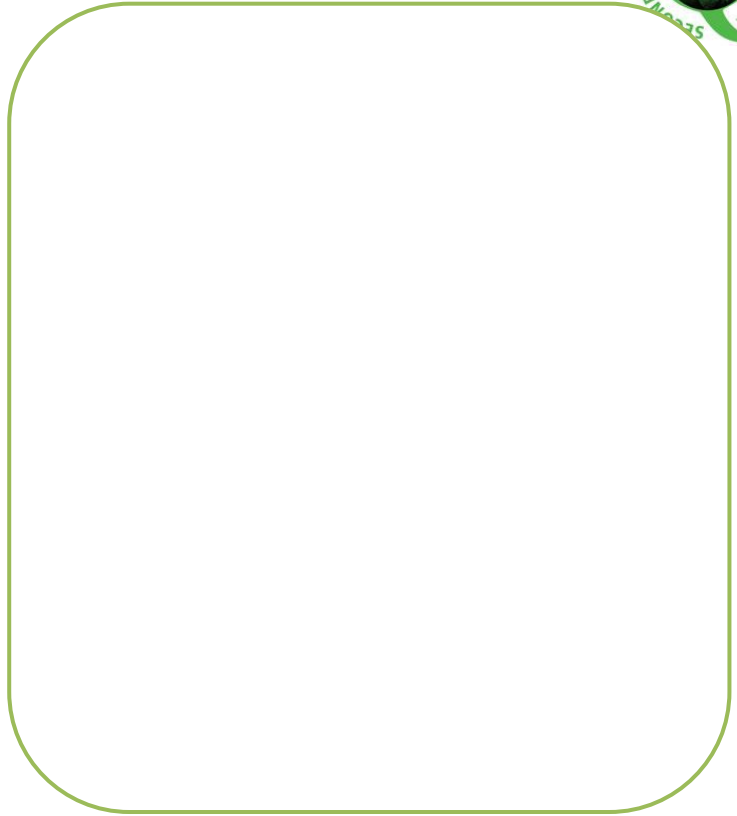


- Woodland
- Arable and Horticulture
- Grassland
- Mountain, Heath, Bog
- Water (inland, sea, estuary)
- Built-up areas

<b>Woodland:</b>	26.4 %
<b>Arable / horticultural:</b>	18.0 %
<b>Grassland:</b>	31.5 %
<b>Mountain / Heath / Bog:</b>	0.1 %
<b>Urban Extent:</b>	11.3 %

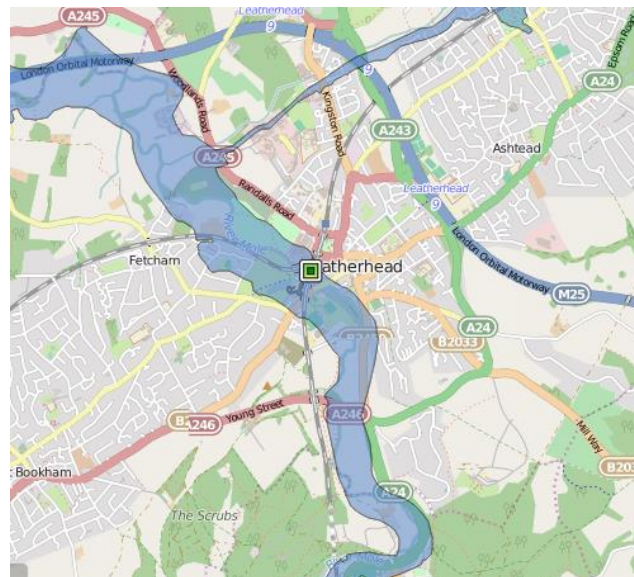
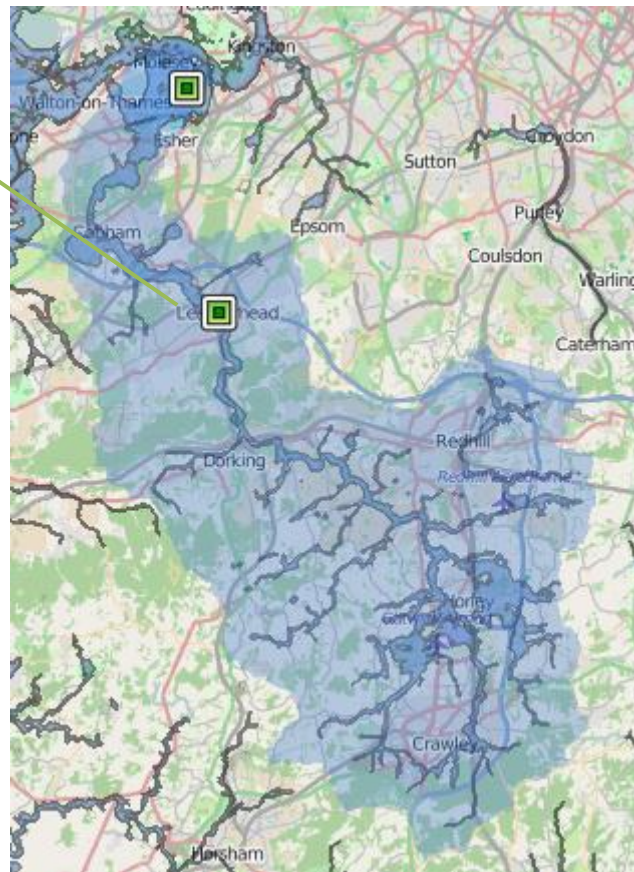
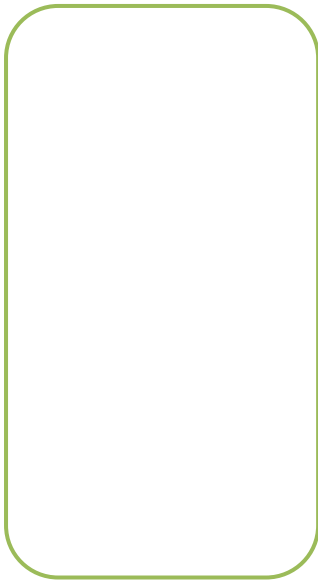
Catchment flood risk area (1 in 100 year flood)

# River Mole flooding impacts



**Fieldwork locations**

# River Mole flooding impacts



News Articles on River Mole flooding



# River Mole flooding impacts

## Thousands hit by floods and power cuts at Christmas

Flooding is causing difficulties for thousands of people in southern England after stormy weather lashed the UK. Three severe flood warnings are in place in Surrey and Dorset, with many people rescued from homes overnight.

The River Mole in Surrey has burst its banks in several areas and an Environment Agency severe flood warning - which means a danger to life - has been issued for Leatherhead

Residents were evacuated from their homes in Dorking, Leatherhead and Guildford.

Firefighters in Surrey and Kent broke a five-hour nationwide strike to help deal with the effects of the storms.

The power cut at Gatwick's north terminal was caused by flooding on the Mole which affected airfield substations and saw more than 30 flights cancelled and police called in to man information desks.

Around 100 flights are due to leave Gatwick on Christmas Day - including some services rescheduled from Tuesday. **Source: BBC**

## River Mole flood scheme "not designed to protect Leatherhead"

THE Environment Agency has admitted its flood alleviation measures on the River Mole are "not designed to protect Leatherhead".

Along with Fetcham, the town was among the worst-affected areas in Surrey when the highest level of flooding seen in Mole Valley for 45 years hit on Christmas Eve.

Lyndsey Murphy-Sugrue, who lives in Fetcham's Cannon Grove, was one of many flooded-out residents who have been left unable to return to their homes for months.

She told the Advertiser: "Residents are furious after word has spread that the reason we flooded so badly was that the floodgate was raised at Molesey to protect that area and Fetcham and Leatherhead received the backlash of that decision.

"Answers are wanted as to why and when that decision was made and why our residents were not alerted at the same time.

"We should have had warning that within the next 24 hours the gate would be closed and advising properties would definitely flood within a certain timescale. The flood modelling they do would have all these answers."

Environment Agency spokeswoman Narinder Sokhi said the organisation had put the Lower Mole Flood



## River Mole flooding impacts

Alleviation Scheme into operation on December 19 in preparation for predicted heavy rainfall.

She confirmed the agency issued a flood warning for Leatherhead at 8.09am on Christmas Eve, which was then elevated to a severe warning at 2.10pm after river levels rose quickly.

She said: "Leatherhead is 10km upstream of the Lower Mole Flood Alleviation Scheme and [it] is not designed to protect Leatherhead, but it does help reduce flood risk along the River Mole by improving the flow of water into the River Thames.

"The scheme was operated successfully and protected 10,000 properties in the Hersham and Molesey area."

Mrs Sokhi said the flooding in Leatherhead had been caused by rain falling on already heavily saturated ground. On December 23 and 24, 75mm of rain fell in the River Mole catchment, causing the highest water levels seen there since 1968. In an average year, 84mm of rain falls in the whole of December. **Source: Dorking and Leatherhead Advertiser**

### **£2.7 million River Mole flood scheme will protect 645 homes**

EXPERTS are drawing up plans on how to protect several areas of Mole Valley from flooding – a year after they were devastated by record levels of rainwater and high winds.

Dozens were forced out of their homes, some for several months, after the River Mole burst its banks on Christmas Eve last year, with floods wreaking havoc on villages such as Fetcham and Brockham.

In response to public calls for better protection, the Environment Agency (EA) has announced its intention to start work reinforcing defences around the River Mole some time after 2016.

The Leatherhead and Middle Mole Flood Alleviation scheme is expected to cost £2.7million, and aims to protect 645 homes along a stretch of the River Mole by March 2021.

An EA spokesman said: "We are beginning to look at the long list of possible options for the catchment and will refine these over the next couple of months.

"When this work is complete we will talk to the communities at risk about the most appropriate solutions for their area.

"As part of this project we are also undertaking detailed hydrological and hydraulic modelling of the middle River Mole to improve the existing flood mapping and modelling and help us identify the most appropriate way to reduce flood risk. **Source: Dorking and Leatherhead Advertiser**



# River Mole flooding impacts

## Flood impact score card:



### **Social Impact:**

How does it affect people? Does it stop people from gaining access to the building? Does it affect their quality of life?

- 0 – No Impact
- 1 – Low Impact (car parks, allotments etc.)
- 2 – Medium Impact (housing, flats etc.)
- 3 – High Impact (public buildings – police, fire, local / national infrastructure)

### **Economic Impact:**

How is the Property damaged? What would be the cost of refurbishment after the flood? Is it stopping people from running businesses?

- 0 – No Impact
- 1 – Low Impact
- 2 – Medium Impact (shops, retail, small business)
- 3 – High Impact (transport links, office, high status retail, farmland – loss of crops / animal life)

### **Environmental Impact:**

- 0 – No Impact
- 1 – Low Impact (recreation ground, play areas)
- 2 – Medium Impact
- 3 – High Impact (local nature reserve)

**\*Use the scores above to record the impact of flooding around leatherhead.**



# River Mole flooding impacts

## Leatherhead perception analysis

### (questionnaire)

Do you live in Leatherhead?

Yes	No

Do you know about flooding in Leatherhead?

Yes	No

How big an impact would you say flooding has on the people of Leatherhead?

No Impact	Little Impact	Moderate Impact	Large Impact

How has flooding impacted the people of Leatherhead?

Do you think Leatherhead needs flood defences?

Yes	No