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# York Flooding



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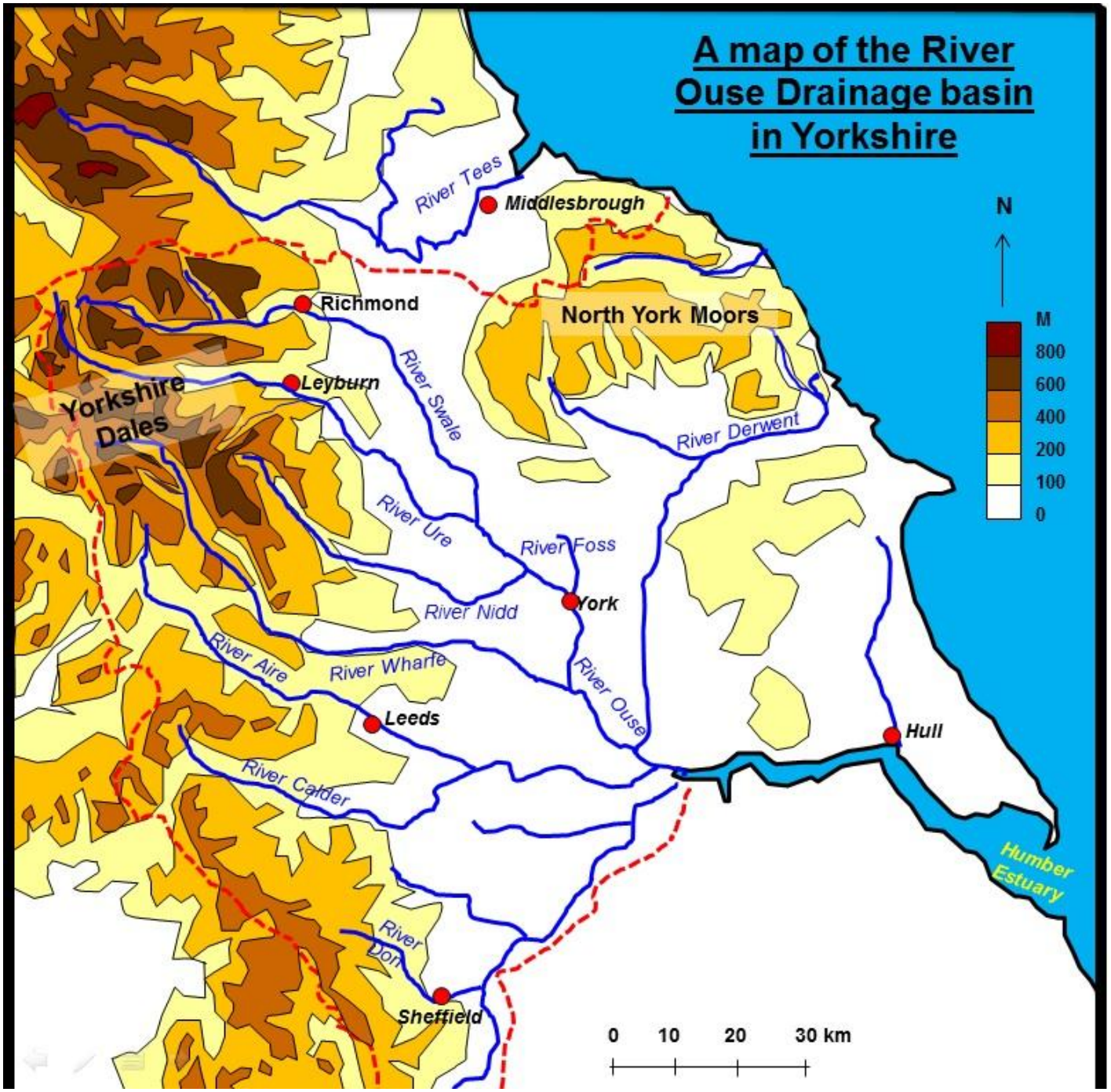
Location – **Located in the north of England, this drainage basin covers most of the Yorkshire Dales and the Vale of York, the river eventually enters the north sea via the Humber estuary.**

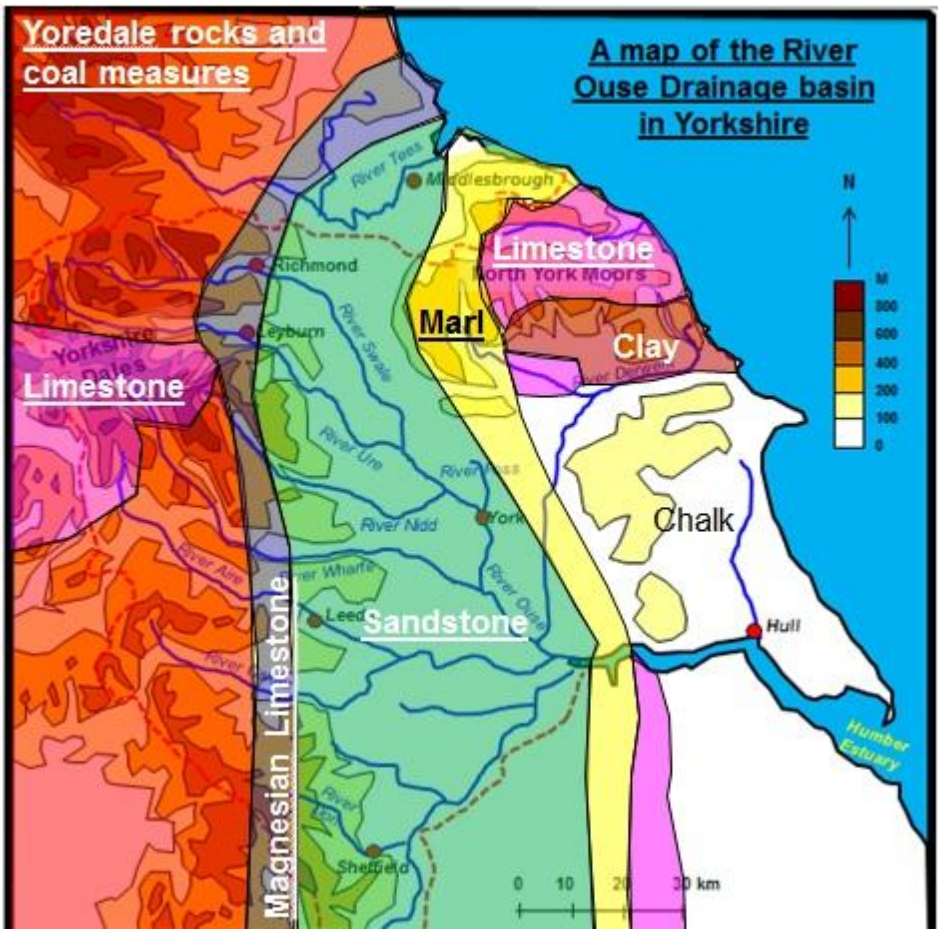
Drainage Basin Influences - There are 8 major influences on the discharge of the river Ouse. These could be transferred to any major drainage basin.

**Physical factors**

1. Relief **– the relief of the upper course of the river basin in the Yorkshire dales is very steep.** This promotes fast runoff from the slopes into the rivers and less soil infiltration.




2. Geology and Geomorphology – there are seams of Permian Limestone that allow water through its structure quickly. There is also a substantial amount of clays that are impermeable, this water cannot infiltrate the soil and hence gets into the river quicker – reducing lag time.




3. Vegetation – At high altitudes in the upper basin the vegetation is heathers and moor land that has low interception rates. There are areas of scattered coniferous trees with better interception year round, while deciduous trees offer good interception until they loose their leaves. Much of the lower basin is farmland offering little interception.

4. Soils – peat soils in the upper basin act like a sponge and absorb much of the summer precipitation, lowering peak discharge. From late autumn these stores are full and hence subsequent water finds its way into the tributaries.

5. Climate – The Ouse section of the basin is flat and receives about as much precipitation (640mm per year) as is lost through evapo-transpiration (540mm per year).

**The water that floods York hence comes from the Dales area which receives heavy rainfall, which ends up in York via the Swale, Ure and Nidd tributaries.**

## Human Factors

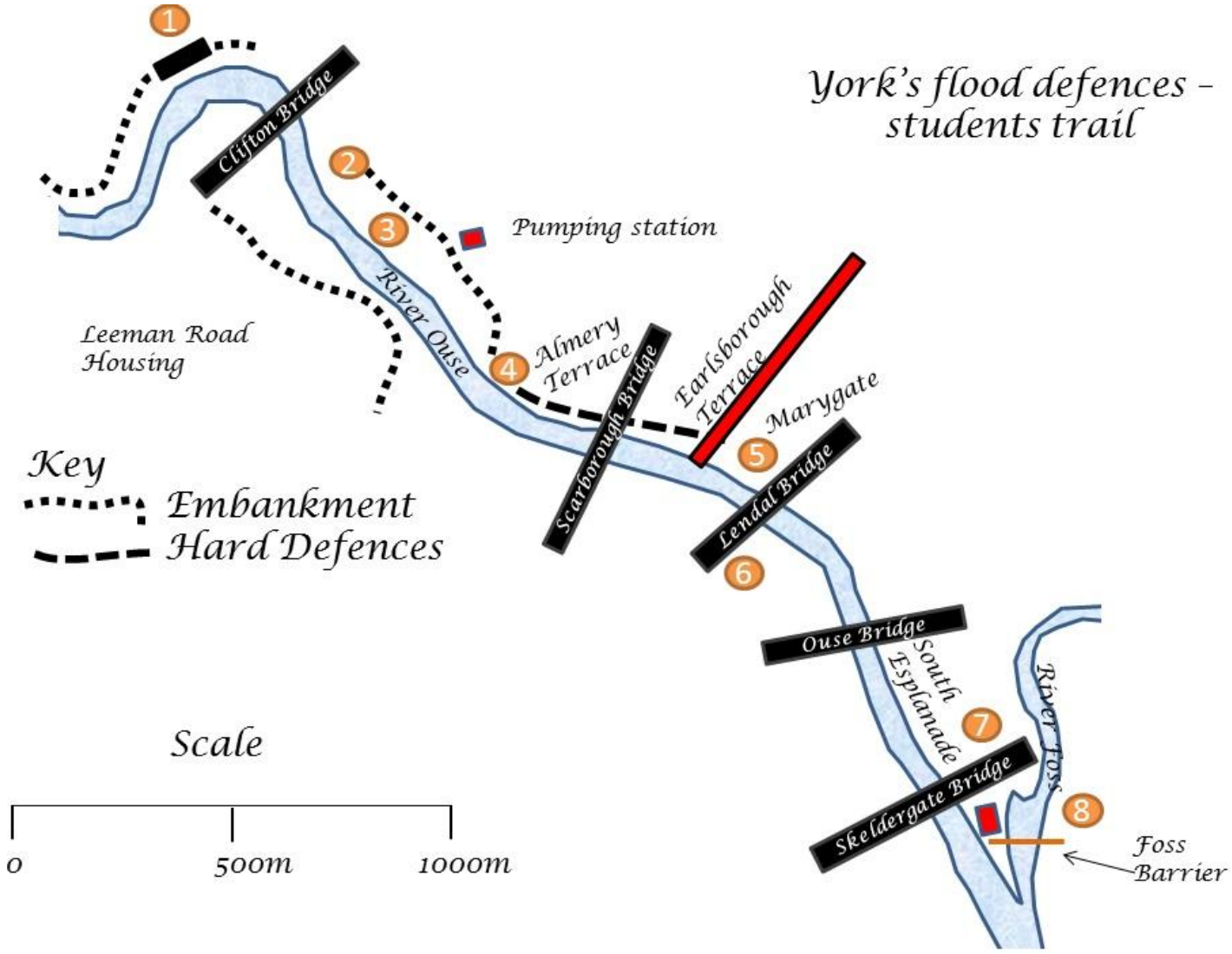
6. Farming **– Upland areas are used for pastoral farming – the grasses the cattle etc feed upon offer little interception.** Drainage of the uplands also speeds water into

tributaries.  Arable farming on the Vale of York has removed some trees and leaves fields exposed with no interception when crops are harvested.

7. Forestry - There has been some afforestation in the Ure catchment area.

8. Urban Developments – New housing areas, out of town shopping areas, industrial areas, the widening of the A1 have all created impermeable surfaces and drains carry storm water quickly and directly into the river Ouse.  **This has happened extensively to the North of York on Clifton moor, this could contribute to a rise in discharges.**

## Flood control schemes From North to South




Clifton **Ings – a flood washlands scheme, the land here is surrounded by embankments and is allowed to flood to save the city of York, it can hold 2.3million cubic meters of water.**

Clifton Ings and embankment

Outlet sluice at Clifton Ings

Leeman road – Embankments have been built here from residue from the sugar beet factory. They are quite far away from the rivers edge to increase the channel capacity (it can thus hold more water).

Embankment at Leeman Road Close up, just behind the dog walker

Embankment at Leeman Road

Almery terrace – Concrete floodwalls with rubber sealed gates protect these houses.  The walls are directly in front of the housing and offer just a little protection.

River channelisation - the River Ouse has been straightened and lined so that water moves through it efficiently

The General Accident offices – the bottom floor is set aside for car parking so that nothing valuable is lost during a  flood.  This is a planning measure to limit flood damage

General Accident Offices

Height of floods in the Kings Arms Pub, which sits on the River Ouse

**Source** Foss Barrier – This barrier stops the River Ouse water backing up the river Foss ( a tributary) and causing damage to some of York's Most historical buildings.  Water from the

Foss is pumped into the river Ouse.  Are these schemes effective?
The Foss Barrier

The Foss Barrier Pumping station
The floods of 2000
In November 2000 for example, despite continued improvements to York's flood defences, part of the central area of the city was flooded after a series of low pressure systems brought heavy rain to the north east and the worst flooding in Britain for 50 years. 3,000 York residents had to be evacuated from their homes, and the army was brought in to help. The big difference about this flood was that it affected areas previously though to be at little risk. Ironically, only a month earlier York had hosted the first National Flood Forum, which aimed to give homes and businesses practical advice about defending property from flooding. In 2000 the floods broke previous records for flooding in York – in 1982 waters had risen to 16 feet 7 inches above normal. Due to its complex geography and the historic importance of the city, attempts to defend York against floods continue. So far this has cost approximately £10 million.
The flooding was caused when several depressions swept across Northern Britain bring lots of rain (35-40mm in 24 hours), this occurred in early November 2000.  This had huge social impacts, 3000 people were evacuated, and the army had to be called in.  The River Ouse was 4.8 m above normal level and this caused York race course to be completely flooded - No racing at the race course!  The economy was also hard hit, one insurance company alone paid out £12.5 million in flood damage claims between 2000 and 2010 in York. In 800 claims, at an average of £25,000 per flooded property. The flooding also cost the City of York Council £1.3m with protecting properties by sandbags and other means was the biggest single expense, at £394,000. Over £100,000 was paid to the fire service, and £41,000 to the army for the help they provided. The council has been able to reclaim a almost half the total bill from the government but the city still had to find £772,000 from its own resources. There was also £10 million in lost income because it led to 200,000 fewer visitors coming to York, plus the economic consequences effects on the Selby to York railway line. John Prescott pledged a new national recovery team to help flood victims, with the promise of £51m extra funding for flood defences and warning systems.  Mr Prescott added that he had asked insurance companies to speed up payments.  Flood defences in the historic walled city were shored up with 15,000 sandbags in a huge weekend operation involving the emergency services, army and local people, it was insufficient for large areas of the town however.  Another response was to open two rest centres in the city for flood victims and 65,000 sand bags were put into place by 500 army personnel

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