

Six different sites in
the river wye, at the
western part of the
peak district es...



**ASSIGN
BUSTER**

For my GCSE Geography coursework I will be analysing six different sites in the River Wye, at the western part of the Peak District. The six sites that I am visiting and investigating are: south of Buxton, eastern part of Buxton, Millers Dale, Litton Mill, Ashford on water, Bakewell.

Brief Background about the Peak District and the river Wye

The Peak District was England's first National Park, dazzling its importance as a beautiful Landscape.

The Scenery of the Peak District consists of generally isolated and extraordinary hills and coasts, as well as the natural wetlands. All the flora and fauna habitats which exist today have been intensely affected by thousands of years of the hustle and bustle of us humans. This now has changed the landscape promptly. For example most of the land of the Peak district would have been forested if there was no human activity. By keeping the national park uncontaminated and farming the land, the people have now produced a prosperous, hygienic and historical view with a larger variety of habitats.

The River Wye is the foremost river of the western part of the peak, increasing on Axe Edge above Buxton and streaming eastwards through Buxton and Bakewell to connect to the Derwent of Rowsley. The river goes underground subsequently to its source and re-emerges in Poole's Cavern which then runs down the town centre of Buxton.

Between Buxton and Ashford the river has had to sculpt an extended series of gorges which exemplify this section and the river always lies in the deep-

cut valley which is often lined with cliffs and is sometimes outstandingly narrow.

So why do we Study Rivers?

We study rivers because just like us human beings have homes, the flora and fauna also live and have their own territory. This means little water creatures have their homes under rocks or on top of the rocks in order for them to survive. Furthermore food webs help us also identify what kind of producers, consumers live and how they survive. Nevertheless, some rivers like the River Thames also run through cities. We also obtain knowledge about the speed of the river, whether the river is oxygenated or the bedload in the water is affecting the landforms causing it to erode. This may well affect the aquatic floras in terms of reproduction etc.

River variables change downstream. The variables which should change are:

? Velocity: it always increases however a small amount than width then the channel becomes smoother as there is less friction downstream.

? Depth: the depth of the river increases only a tiny amount however it decreases the vertical (lateral) erosion.

? Width: the width increases for the reason that the river becomes wider as it progresses. However, it does not erode sideways as it is flowing upstream because the water clashes with the v - shaped valley which eventually gets wider.

? Discharge: is the amount of water in the river. To calculate how much water there is in the river we as a class have come up with an equation which is $\text{area} \times \frac{1}{2} \text{speed}$. Discharge increases because tributaries join in the main river; hence, there is more water. Moreover, when a river meets a tributary then this precise part is called a ' Confluence'

? Bedload size: it decreases because there is a big supply of bedload which has fallen of the valley side. It is then transported downstream where there is flat land with no valleys.

? Bedload shape: the bedload in the water becomes rounder due to attrition taking place. This means when the rocks are angular meaning rocks which are sharp and edgy, it hits against other rocks causing it chip of the edges, which eventually gets rounder.

? Turbulence: it decreases in the way that the bedload in the water erodes which then makes the channel smoother, so the water runs over the smooth surface and is never deflected. This means that upstream water bounces and deflects of the big rocks so that it traps air and becomes more turbulent.

? Efficiency: this increases due to the shortage of bedload which gives less friction. Then the channel becomes wider and deeper.

The main aim of this study is to examine the alterations that occur along the length of the River Wye in the Peak District.

My second aim is to show the significant changes in shape, landforms, processes, and the management of the river.

My aim is broken down into key questions.

My key questions are:

- o How does the physical shape of the river change as you go downstream?
- o How does the valley change as you go downstream?
- o How is the river used by people?
- o What are the flood risks? Do they change as you go downstream?

My hypotheses are:

- o The hydraulic variables will not change as I go downstream.
- o The valley shape will change as you go downstream.
- o Erosion, transportation and deposition changes as you go downstream.
- o People use the river differently as you go downstream.
- o The flood risk does change as you go downstream.

In this section, I will be examining in detail of all my graphs. By analysing these graphs I will conclude on the 5 hypotheses and decide if I agree or disagree with them.

Here are my Hypotheses:

1. Hydraulic variables do not change as you go downstream
2. The valley shape will not change as you go downstream

3. Erosion, Transportation and deposition do not change as you go downstream.

4. People do not use the river differently as you go downstream

5. The flood risk does not change as you go downstream.

Mean Velocity

As you can see from figure 1 I have drawn a cylinder bar chart for the mean velocity. The trend of this graph is fluctuating because the velocity is not steady, as it is decreasing and increasing. This does not match my original hypothesis. The sites which do not follow my hypothesis are site 11 and 42. For the reason that, at site 4 the water was turbulent because of the channel being narrow and there was a mill, therefore the water is being squeezed out. The motive of site 1 being slow is because there was more vegetation and big bedload in the river, consequently making the water travel leisurely. The velocity peaked at Litton Mill with a staggering 0.67m/s; also it is the highest speed that the water was running. Possibly because of the valley being more 'U' shaped, making it go downstream.

Mean Bedload Size

As you can see I have plotted the mean bedload size in a regular bar chart. The trend of this graph is that at first the size of bedload increases until when at site 2 where there is a strange reading of the results measuring a staggering 50.4m. This does not follow my initial hypothesis because site 1 and 2 are unusually high. The reason being this is because before we studied

the area the valley must have eroded and some rocks must have fallen of and sank into the river.

Mean Depth

As you can see form figure 3 I have drawn a regular line graph to show the results for the mean depth for all six sites. However from figure 5 to 10, I have drawn channel shape graph, consequently I will analyse about them. Firstly at site 1 it is jagged because of the fact that there was plenty of bedload. In contrast to site 6 where it is more rounded, deep at one end and shallow on the other. This process is called meandering. Site 4 is flat because people have made it that way because of human activity. This gives me a hint that it does not follow any of my hypotheses in the way that erosion is taking place, meandering is taking place because of transportation and the main point is that this hydraulic variable does change.

Efficiency

As you can see for figure 4 I have drawn a bar chart horizontally. Basically I worked out the efficiency³ because of the fact that I cannot analyse wetted perimeter. Looking at the graph tells me that site 2 has a better efficiency in the way that there is better transporting of water going downstream. Even though it was upstream. However site 1 does not have that much of efficiency maybe because of the bedload making the water travel slowly. This is clear that this does not follow my hypotheses, because the main issue is that it is fluctuating. At one time it increases, decreases, then it goes at a steady pace.

Width

From looking at my graph for the width of all six sites, I can say that it is fluctuating but a small amount. For example, at site 1-Monsal Trail, the first measurement was 5.32 metres. This tells me that the river may be narrow as site 2 and 4 were the narrowest jointly 4.8m. Site 4 was narrow because it has been diverted because of a mill. This process is called Channelisation. The trend of this graph is steady at the first three sites then abruptly, the trend increases at site 5 Ashford in the water, with a staggering 11.3m as the width, subsequently, at Bakewell it gradually decreases but only a small amount of only 1.5m difference. Because of site 5 and 6 being narrow there was a promenade and a car park making it thin and consequently the water would be turbulent. This does not follow my hypothesis, as you can see from the results I have established. For example site 1 and 3 do not follow my hypothesis. In many ways that the valleys shape must be different. A v shaped at one site and a u shaped on the other site.

Bedload Shape

From figure 13 to 18 I have hand drawn kite diagrams. The trend of these graphs is fluctuating in the sense that the bedload shape is not varied. For example, in site one there was mostly very angular bedload, possibly because of the fact the valley was narrow and v shaped. In contrast to site 6 where there was mostly rounded bedload, here the reason may be that the river has been changed by human activity. This does not follow my primary propositions because of the fact that people do use the river differently

causing the river to change its shape. Also there is also a greater flood risk in many parts like in site 5 where it is flat and could destroy homes etc.

Area

As you can see for figure 19 I have hand drawn proportional circles for area. The trend of this graph is fluctuating. This does not follow my original hypothesis. The sites which do not follow the hypothesis are site 1 and 4. This is because the area at site 1 is small; the reason for this is that the vegetation was covering up the area so it looked swampy. The reason for site 4 being so small is because of the mill which diverted the river into two causing the area being undersized.

Discharge

For figure 20 I have drawn proportional squares for the discharge. The trend of this graph is fluctuating. Also it does not follow my hypothesis. For example, at site 3 people built bridges making the channel narrower. Furthermore at site 6 the river had weirs; it was slow and oxygenated which allowed fish and other aquatic fauna to have habitats

For my Conclusion I have five hypotheses which I need to confirm whether the predictions I made were correct or incorrect.

Here my assumptions:

6. Hydraulic variables do not change as you go downstream

7. The valley shape will not change as you go downstream

8. Erosion, Transportation and deposition do not change as you go downstream.

9. People do not use the river differently as you go downstream

10. The flood risk does not change as you go downstream.

After contemplating about each hypothesis I now come to a decision that I disagree with all five hypotheses. I will go on to prove why I disagree with it.

Firstly, Statement 1: "Hydraulic Variables do not change as you go downstream" I contradict with this assertion because by looking at my graphs, tells me that they distinguish from this.

For example, if I look at site 14 for Depth it tells me that the site was not streaming in a habitual channel (the 4th interval started a negative point of 0.03), hence it was flowing in a precipitous sided gorge, and this determines whether there is a V-Shaped Valley as it was going upstream. In contrast to site 65, as the water was flowing downstream as it was a flat land and was wider (1st to 5th interval was flowing normally, 0.3m, 0.44m, 0.45m etc.).

Another example is the Width for all 6 sites. The width started off at 5.32m at Monsal Trail until site 4, Litton Mill where it began to gradually increase suggesting that at upstream there were v-shaped valleys and when we investigated from site 5 to 6, it was downstream and more flat ranging from 11.3 to 9.8m.

Furthermore, the Mean Velocity for all six sites tells me that the speed of the water for the first three sites varied from 0.20m/s to 0.30m/s. Then there <https://assignbuster.com/six-different-sites-in-the-river-wye-at-the-western-part-of-the-peak-district-essay-sample/>

was a peak at site 4, After Litton Mill; with a staggering measurement of 0.67m. The motive of this was that there was a footpath and the channel was diverted by the water in order for it to work. Also there were walls on the banks making it narrower, consequently the water was gushing.

Statement 2: The valley shape will not change as you go downstream

Once again I disagree with this prediction as during the investigation of all six sites tells me that because of the velocity increasing the V-shaped valley became flatter when coming to Ashford in the water, may reckon that when there is a V-shaped valley the water gushes rapidly but going downstream, the water channels its way slowly.

In addition, the width of the river depends on also how the valley is shaped in the approach that

If the width of the river is narrow, this means that the valley must be a V-shaped. On the other hand, if the distance across the river is wide then that may hint that the land is flat and is a risk of flooding (see prediction on the risk of flooding).

Statement 3: Erosion, Transportation and deposition do not change as you go downstream.

Once more I strongly disagree with this prophecy because erosion, transportation and deposition do change as you go downstream. For example, erosion takes place when small rocks or sediment fall of the valley wall which then plunges into the water. It is the transported in many ways.

For example, when rocks roll in the water (know as traction) it carries itself <https://assignbuster.com/six-different-sites-in-the-river-wye-at-the-western-part-of-the-peak-district-essay-sample/>

(known as suspension), until there is a position where it can no longer travel. Whilst travelling, under the bed it bounces against other bedload (known as saltation) or in many cases big bedload which causes it to break into smaller pieces. This is known as Attrition.

Moreover this action that takes place affected our results for bedload shape and size. For instance, in site one7, most of the bedload was Very Angular. This may imply that because of the rock itself smashes against other rocks, making it jagged. On the other hand in site 68, most of the bedload were rounded, hinting that there was less rocks on the bed of the water, consequently the bedload could travel easily.

Erosion can affect the width of the river in the way that if the wall of the valley begins to break it can cause the river to get wider just like what happen to site 5 Ashford in the Water, with a staggering 11.3 metres measuring the width.

Statement 4: People do not use the river differently as you go downstream

This statement clearly tells me that this is not true, in many ways. For example we came across some people who were fishing, maybe because it was a good place to fish.

Statement 5: The flood risk does not change as you go downstream.

This is a false statement in the way that naturally there is going to be a flood risk in any river. However the point is that if the river is going downstream then there is a flat lane giving a very likely risk of flooding when there is heavy rain.

<https://assignbuster.com/six-different-sites-in-the-river-wye-at-the-western-part-of-the-peak-district-essay-sample/>

Limitations

In this part I will be stating how my project could be improved overall, if we did it again.

Here are my reasons:

1. Firstly, I would have chosen a different location and a River. For example the Lake District
2. Secondly, I would have made each site equal in the way that each site is 100m gap etc
3. Thirdly, I would have change the timing of the year, denoting that I would choose a different season like winter, and then compare the difference.
4. Finally, It would have been better if there was more people in a group, thus we would of found an accurate result overall.