Geography Fieldwork Answers: Physical

Title: How and why do the characteristics of the River Ogmore change with distance downstream?

Explain the advantage(s) of the location used. [2]

We used the River Ogmore because it is only 10 miles long, ✓
which made it easy to survey points along the whole river within one day. ✓

Suggest why data you collected may have been inaccurate. [2]

The hydroprop that we used to measure the velocity may have been affected by friction, ✓
so our velocity measurements may have been lower than the actual velocity. ✓

Justify one primary data collection method used. [3]

We measured the width of the river at each point on the river to test our results against the Bradshaw model (which states that the width should increase downstream). ✓
The width of the river allows us to determine the effect of lateral erosion. ✓
We used systematic sampling instead of random so that we could cover the whole river. ✓

Identify one potential risk and explain how it was reduced. [3]

There was a risk of slipping, as the ground was very wet. ✓
We all wore wellies ✓
so that we wouldn't fall over and hurt ourselves. ✓

Justify the use of maps, photographs or field sketches. [3]

We used ArcGIS maps to show our results next to the locations of our sample sites. ✓
This allowed us to have a clear visual interpretation of our results, ✓
and to easily draw conclusions from them. ✓

Assess the effectiveness of your data presentation techniques. [6]

Having calculated the distance from source at each sample site, we then used Excel to create scatter graphs of width and depth against distance. This allowed us to easily establish a positive correlation between all variables, but we would have needed more data to establish how strong this correlation is (because we only took readings at five locations).

For velocity, we geolocated all of our data using GPS and overlayed the data onto an ArcGIS map using proportional circles to represent the magnitude of the velocity at each point. We saw a clear increase in velocity from source to mouth, with the biggest increase being near the source. However, again, more data is needed to make further conclusions about these results.

Assess the suitability of your chosen location. [6]

The river is only 10 miles long, so we could survey points along the whole river within a day. Also, the river is shallow enough for us to access it. Furthermore, there is a footpath along the side of the river which makes it very accessible.

However, a section of the river near the town of Bridgend is not as accessible because of river management (unsafe) and so we could not collect primary data there. Also, close to the source, the ground is too steep and slippery, so we were not able to collect data there either.

Assess the effectiveness of your data collection methods. [6]

To measure the width, we used a measuring tape at each point along the river to measure the distance from one bank to the other. Although this was fairly accurate, the vegetation near the banks may have slightly skewed the measurement.

To measure the depth, we took three measurements, 25%, 50% and 75% across the width of the river at each point, using a metre ruler. We then took the average of the three values. However, the depth varies a lot and so taking just three measurements isn't fully accurate. Also, because a lot of us were in the river at the same time, water may have been displaced, making our measured depths higher than the actual value.

To measure the velocity, we used a hydroprop and a stopwatch, and then calculated speed = distance / time. However, friction may have caused some inaccuracies, and groups further downstream may have measured lower velocity values, as the water was slowed down by the people further upstream.

To measure the sediment size and roundness, we used callipers and Power's Scale of Roundness. The latter is a subjective scale, which is not very useful. Also, as we were randomly choosing pebbles by hand, there is a chance that we were subconsciously choosing pebbles which would fit our conclusions.

To what extent did your results and conclusions meet the overall aim of your enquiry? [9+3]

The aim of our enquiry was to find out how closely the River Ogmore fits the Bradshaw model. To do this, we measured five variables at each point along the river: width, depth, water velocity, sediment size and sediment roundness. The Bradshaw model predicts that width, depth and velocity should increase downstream, and the sediment should become smaller and smoother. This is because as tributaries join the river, discharge increases, therefore increasing vertical and lateral erosion.

Our results clearly support the Bradshaw model. The width nearly tripled from Site 1 to 5, and the depth increased by over 500%. Velocity also increased by almost an order of magnitude from the source to the mouth. We also found that the sediment size decreased rapidly along the river, and the roundness tended to increase, although this had the weakest correlation of the five variables that we tested.

However, our data collection methods could have been improved. When measuring the depth, some water may have been displaced because we were all in the river at the same time, which would have skewed the results. Some of the hydroprops were faulty, and there may have been better ways of measuring the velocity (e.g. by dropping dyed water at one point and timing how long it takes to travel a certain distance). Also, Power's Scale of Roundness is subjective and we do not get numerical results, making it harder to analyse.

But overall, our results and conclusions did meet the overall aim of our enquiry.