UNIT 7: FIELDWORK
RIVER LANDSCAPES

AIMS AND ENQUIRY QUESTIONS

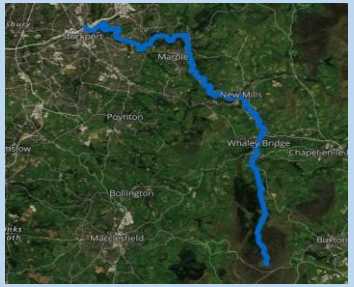
To investigate how the River Goyt changes with distance downstream to see if it follows Bradshaw's model.

1. How does river discharge change with distance downstream?
2. How does channel shape change with distance downstream?
3. How does flood risk change with distance downstream?

INTRODUCTION

BACKGROUND INFORMATION

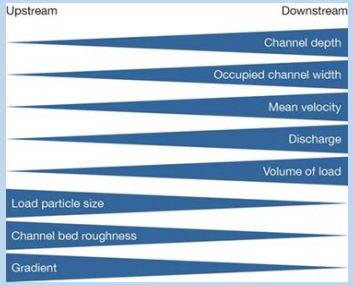
- 49km from source to mouth.
- Source of the Goyt- Axe Edge Moor 532m.
- Major tributaries of the Goyt include the Sett and Etherow.
- Mouth of the Goyt- River Tame in Stockport. Continues to the Mersey, entering the Irish Sea.
- Water used for drinking water (Errwood and Fernilee reservoirs) and to supply water into the Peak Forest Canal.
- Goyt and its reservoirs cause flood risk for settlements such as Whaley Bridge and New Mills.



GEOGRAPHICAL THEORY

Bradshaw's model shows how river characteristics change with distance downstream.

- Depth increases due to vertical erosion.
- Width increases due to lateral erosion.
- Velocity increases due to reduced friction and increased volume of water.
- Load particle size and channel bed roughness decreases due to abrasion and attrition.



SITE JUSTIFICATION

- **Proximity:** Close to school. More time could be spent collecting data meaning more repeats making it more reliable.
- **Safety:** Shallow with easy access points. Meant group could enter water to measure directly making it more accurate rather than estimating.
- **Secondary data:** Showed that there was a difference in flood risk between upper Goyt and Whaley Bridge.

METHODS

SAMPLING STRATEGIES

Systematic- Break the river into equal intervals e.g. every 500m.
+ Pro's- Representative as covers whole river, not biased.
X Con's- Time consuming, can't guarantee safe access.

Random- Choose locations using a random number generator e.g. break river into coordinates and choose with a random number generator.
+ Pro's- Not biased, depending on number of sites can be efficient.
X Con's- Not always representative as sites may be grouped, can't guarantee safe access.

Stratified- Uses a strategy e.g. sample in a section river after a confluence.
+ Pro's- Depending on number of sites can be efficient, representative of the river, can guarantee safe access as choosing site to get in.
X Con's- Biased as sites chosen.

We used stratified sampling to locate our sites, with 3 locations chosen in the upper course of the River Goyt. Each location was an accessible point below a confluence as at this point the rivers characteristics should have changed due to an increased volume of water.

FIELDWORK METHODOLOGY

Discharge- Calculated by measuring width, depth, and velocity.

Width (quantitative)- Used a tape measure held tight from where the water met one bank to the other.
Reliable- Repeating by sharing data from rest of class within the same area.
Accurate- Using tape measure with mm graduation. Holding it taught.
Issues- Not holding it taught. Not being able to reach bank if undercut.

Depth (quantitative)- Width broken into 8 points (systematic sampling) with metre ruler used to find out how deep at this point.
Reliable- Repeating makes it more reliable as show outliers across width.
Accurate- Using metre ruler with mm graduation.
Issues- People stood in water increasing depth, measuring rocks not the bed.

Velocity (quantitative)- Timed how long it took a cork to travel 1m. Repeated this 3 times to take an average.
Reliable- Repeating makes it more reliable as shows outliers.
Accurate- Restarting if it got caught. Ensuring it had time to build up speed.
Issues- People stood in water slowing flow, human error with stopwatch.

Flood risk and river landforms.

Field sketch (qualitative)- Drew an annotated field sketch to show river landforms, river processes, and flood risk.
Reliable- Done with similar weather/time conditions so they are comparable.
Accurate- Use of annotations to contextualise features of image.
Issues- Subjective and ineffective in poor weather conditions.

SECONDARY DATA

	Flood Map	River Gauge Data
Use	Shows yearly chance of flooding for property.	Shows real time river levels at New Mills and Marple.
Pro's	Publicly available, highly accurate data.	Increases understanding of depth downstream.
Con's	Doesn't account for real time flood risk and recent change.	Data needs to be collected on same day to be comparable.

DATA PRESENTATION

Cross Profile:
+ Pro's- Clearly shows width and depth of channel allowing for comparison.
X Con's- Only show's cross-profile change not long. Must be on same scale.

Scatter Graph:
+ Pro's- Shows clear trends of downstream change. Identifies anomalies.
X Con's- Shows correlation not causation. Needs enough data to be accurate.

Annotated Image:
+ Pro's- Contextualises quantitative results with site specific details.
X Con's- Only shows a snapshot of the river in both space and time.

CONCLUSIONS

1. River discharge does increase with distance downstream from 0.16 cumecs at site 1, to 0.33 cumecs at site 3, reaching 2 cumecs by Marple. This is because the river cross section increases reducing friction.
2. Width and depth do increase with distance downstream from 2.28m x 0.08m at site 1, to 4.58m x 0.36m at site 3, depth reaching 20m x 0.9m by Marple. This is because of vertical and lateral erosion.
3. Flood risk does increases with distance downstream as the discharge is higher and there is more property at risk in towns like Whaley Bridge.

EVALUATION

Strengths- Using consistent methods allowed us to compile data from other groups to increase the reliability (repeats). Primary data supported by accurate secondary data.

Weaknesses- Use of some inaccurate methodologies such as float and timer (use hydroprop instead) and limited number of sites. Only shows upper course of river on one day.

Opportunities- Visit more sites along a larger stretch of the river over multiple days (after rain/dry; different seasons).

Threats- Time to collect data in different conditions.

UNIT 7: FIELDWORK
CHANGING CITY ENVIRONMENTS

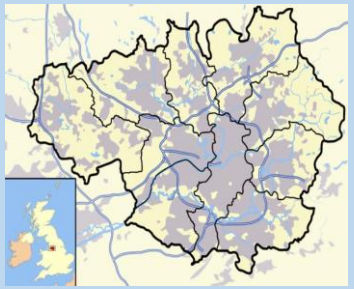
AIMS AND ENQUIRY QUESTIONS:

To investigate the changes with distance towards the CBD to see if Manchester follows the Burgess model.

1. How does the type of residential buildings vary from the suburbs inwards (Burgess Model)?
2. How does environmental quality vary in different areas (zones) of Manchester?
3. How do experiences differ between the city centre and Trafford centre?

INTRODUCTION:

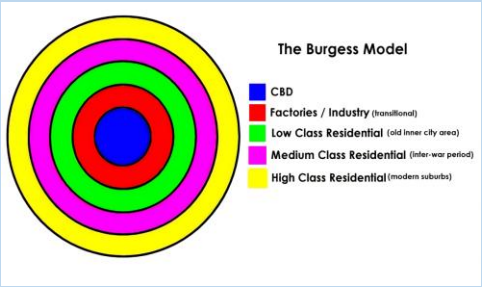
BACKGROUND INFORMATION



- City in NW England, 160 miles from London.
- Population of 550,000 with 2.8 million in Greater Manchester.
- Historically important for its role in the cotton industry but has undergone de-industrialisation.
- Regeneration projects such as MediaCityUK in Salford have attempted to improve quality of life.
- Attracts people from across the country and world for education.
- Problems with deprivation remain particularly around housing.

GEOGRAPHICAL THEORY

The Burgess model shows how land use changes with distance from the CBD in a city.



- With distance from the city centre land value decreases so properties are larger with more open space.
- Industry was historically found in the inner city due to transport and investment, with terraced houses nearby for workers.

SITE JUSTIFICATION

- **Proximity:** Close to school. More time could be spent collecting data meaning more repeats making it more reliable.
- **Safety:** All areas have easy access for coach drop-off with footpaths around to ensure safe movement within the location.
- **Secondary data:** Showed that there was a difference IMD and housing type between Hazel Grove, Didsbury, and Moss Side.

METHODS

SAMPLING STRATEGIES

Systematic- Overlay the Burgess Model on Manchester and break into equal intervals e.g. every 1.5km.
+ Pro's- Representative as covers whole of Burgess Model, not biased.
X Con's- Time consuming, can't guarantee safe access, misses out lots of city.

Random- Choose locations using a random number generator e.g. break Manchester into coordinates and choose with a random number generator.
+ Pro's- Not biased, depending on number of sites can be efficient.
X Con's- Not representative as sites may be grouped, can't guarantee safety.

Stratified- Uses a strategy e.g. visit a location representative of each part of the Burgess Model.
+ Pro's- Depending on number of sites can be efficient, representative of the Burgess Model, can guarantee safe access as choosing site to get in.
X Con's- Biased as sites chosen, might not represent the whole city.

We used stratified sampling to locate our sites, with locations chosen in the outer suburbs (Hazel Grove), inner suburbs (Didsbury), inner city (Moss Side) and CBD. Each location should represent the change of characteristics observed when moving into the CBD as per Burgess Model.

FIELDWORK METHODOLOGY

Changes relating to Burgess Model.

RICEPOT land use survey (quantitative)- Used RICEPOT categories of landuse for residential buildings to tally flats, terraced, semi-detached, bungalow, detached.
Reliable- Same method including 10 minute transect to compare results.
Accurate- Identifying every residential building on transect.
Issues- Not knowing how many flats in a building. Short time of collecting.

Environmental quality survey (quantitative)- Used a random number generator to find a point in time along 10 minute transect to stop. Measured different aspects of environmental quality on a bipolar scale.
Reliable- Same method at each site.
Accurate- Range of categories with descriptions to improve understanding.
Issues- Only collected one EQ score for each site. Subjective so not comparable between people.

Annotated image (qualitative)- Took a photo and annotated to show housing type, environmental quality, and other indicators of changing deprivation.
Reliable- Done with similar weather/time conditions so they are comparable.
Accurate- Use of annotations to contextualise features of image.
Issues- Subjective as images may be taken to highlight a good/bad feature.

Retail experiences.

Questionnaire (qualitative)- Asked 5 people a questionnaire in each location.
Reliable- Multiple people so could take an average.
Accurate- Actual opinion of people engaging in retail activities.
Issues- Subjective. Not a representative sample if people don't stop.

SECONDARY DATA

	Census Data	IMD Data
Use	Shows information about life in England & Wales.	Shows deprivation levels across wards in England.
Pro's	Comprehensive, with lots of aspects of life considered.	Clear comparable indicators which are easily visualised.
Con's	Only conducted every 10 years so data may be old.	Oversimplifies issues without saying local causes.

DATA PRESENTATION

Radial Graph:
+ Pro's- Allows for comparison of individual factors across multiple sites.
X Con's- Can get hard to read if too much data presented.

Composite Bar Chart:
+ Pro's- Shows clear comparison of multiple categories across sites.
X Con's- Can get hard to read if too many categories/sites.

Word Cloud:
+ Pro's- Clear to see words that stand out the most. Can be colour coded
X Con's- Doesn't explain why. Doesn't account for synonyms.

CONCLUSIONS

1. Residential buildings to become larger with distance from the CBD with terraced (68) being the most common in Moss Side and detached (74) being the most common in Hazel Grove, supported by census data of 80% and 90% whole house or bungalow, respectively.
2. Environmental quality does increase with distance from the CBD with a score of 17 in Moss Side, to 37 in Hazel Grove, supported by environmental deprivation scores of 17.7% and 47.4% respectively.
3. Whilst the most common word for both was busy, the Trafford centre is favoured with more positive words such as big, and popular compared to dirty, crowded, and mid.

EVALUATION

Strengths- Using consistent methods allowed us to compile data from other groups to increase the reliability (repeats). Primary data supported by accurate secondary data such as house types with the Census.

Weaknesses- Use of subjective methodologies such as environmental quality survey and limited number of sites. Data from one place within one area to represent the entire section of the Burgess model is highly inaccurate.

Opportunities- Visit more sites within each area and visit more areas within the city at different times of year.

Threats- Time to collect data in different conditions and over a broader area.