The fieldwork component



Context

Purpose and value of fieldwork and how it relates to the course

<u>Terms</u>

Enquiry process

Geographical skills

Terms

Primary data

Data collected in the field (by you/your group)

Secondary data

Data that has already been processed in published materials

Terms

Quantitative data

Data that can be measured and counted – and is readily processed using graphs, maps and statistics

Qualitative data

Data that does not have a numerical value, e.g. opinions, comment, descriptions... which is therefore not very easy to process.

It is valuable as it can provide a context for quantitative data.

It can <u>sometimes</u> be encoded it to make limited processing possible (e.g. by categorising people's views/opinions



The Enquiry Process

- **1. Context & planning** identifying/refining questions; choosing suitable locations; deciding on collection methods; risk assessments
- **2. Data collection** acquiring data pertinent to the investigation with an appropriate balance between <u>primary</u> & <u>secondary</u>, and <u>quantitative</u> & <u>qualitative</u>
- **3. Presentation & display** using appropriate methods to enable...
- 4. Analysis & interpretation of findings interrogate data to identify & describe patterns, trends and relationships; apply concepts & processes to understand observed data
- **5. Conclusion** synthesise/summarise findings to draw conclusions relating to original questions
- 6. Evaluation of the whole investigation critically reflect on every stage of the investigation to appreciate strengths & limitations; consider accuracy, validity & reliability of methodology and findings; suggest improvements for further research



Planning the Snowdonia fieldwork



Snowdonia Fieldtrip

The equivalent of three days of fieldwork: 2 half days + 2 whole days

Hur	nan Geography: investigations relating to:	
	Changing Places:	
	Re-imaging/rebranding in Blaenau Ffestiniog	½ day
	Importance of tourism in Betws-y-Coed	½ day
Phy	sical Geography: investigations relating to:	
	Glaciated Landscapes – around Llyn Llydaw on Snowdon:	
	Glacial deposition – identifying landforms in the field	1 day
	Periglacial slope processes – scree development	

1 day

Coastal Landscapes – beach management impacts at Dinas Dinlle

Ecosystems at the Local Scale – sand dunes at Morfa Dinlle



Likert Scale

"Likert (1932) developed the principle of measuring attitudes by asking people to respond to a series of statements about a topic, in terms of the extent to which they agree with them." (<u>https://www.simplypsychology.org/likert-scale.html</u> - 18/04/18)

	Strongly				Strongly
	agree	Agree	Undecided	Disagree	disagree
l would like to spend	\cap	\bigcirc	\bigcirc	\bigcirc	\cap
more time here	\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc

Environmental Quality Assessment – bipolar

Negative	1	2	3	4	5	Positive
There is lots of litter						There is no litter
Noisy						Very quiet
Lots of dog fouling						No dog fouling
No hanging baskets or greenery						Lots of greenery
Shop fronts are run down and dirty						Shop fronts are newly painted and well maintained
Shop windows are dirty						Shop windows are clean
Lots of traffic						Pedestrianised area
Few shoppers						Many shoppers
Buildings are old and not cared for						Buildings are new and modern

It can be difficult to decide on appropriate opposite descriptions

Always make sure you have the descriptions on the correct side of the scale!

Environmental Quality Assessment – scoring

Criteria	+3	+2	+1	0	-1	-2	-3
Houses – upkeep	a manas	x	<u>. 19</u>	23 42 T			
Amount of open space			x		17 TE. 3.		
Open space – upkeep		x	an reserve	10,000			
Streets – pavement quality	1.5.1	x			No.		
Streets – road quality			x			Mar June 1	7
Amount of traffic	1000		x				in particular
Litter – amount	x				Stall Dates		
Mechanical noise level	x						
Public noise level	x			State Land			
Vandalism – amount	x	ST 1350 2		84.77 E 19 22	1 -		THE PROPERTY OF
Graffiti – amount	x	2.74 (n Ne Penale	
Air pollution – fumes/smells	x						
Derelict	x			and the set		S. I PALSON	

Coding – for land use surveys

Land use	Code
Residential	R
Industrial	
Commercial (including retail)	С
Entertainment	E
Public buildings	P
Open space	0
Transport	T
Services	S

You may need to have sub-groups in order to identify more meaningful patterns... ...but having too many could make it difficult to see any patterns at all! Collecting raw data with a view to encoding later might be the best option...

Blaenau Ffestiniog



Regeneration [edit]

Blaenau Ffestiniog's town centre has recently been regenerated. With funding from various organisations, grants and the Welsh Government, £4.5 million will be spent on redeveloping the town centre to create a vibrant^[clanification needed] shopping experience. A new bus station has been built along with new areas that allow visitors to sit back and view the mountains which tower over the town. Several slate structures have also been built with poetry engraved on them. The structures are roughly 40 feet tall and visually "echo" the towering slate hills and mountains. Poetry and local sayings have also been engraved on slate bands set into the pavements throughout the town centre.^[13]

Various walkways have also been installed, as well as a series of downhill mountain biking trials by Antur Stiniog.^[14]

A kilometre-long zip wire is also expected in the town soon. If plans go ahead Blaenau Ffestiniog will have the UK's first vélo-rail, which are popular in France.^[15]

A cyclist on one of the new 'Antur Stiniog' tracks.

Arts [edit]

Many artists come to Blaenau Ffestiniog for the unique^[citation needed] landscape around it, perhaps inspired by the harsh landscape of the slate tips. They include Kyffin

Williams and David Nash. During World War II the National Gallery stored its treasures in one of the mines in the town to protect them from damage or destruction. The large steel gates are still standing and the system^[clarification needed] to preserve the paintings is still in the caverns.

Music [edit]

Blaenau Ffestiniog has a strong musical tradition, from the quarrying boom days with the Caban, male voice choirs and brass bands, to the Jazz/ Dance bands like "The New Majestics" and the popular rock bands of the 80s and 90s such as Llwybr Llaethog and Anweledig, to more recent bands such as Gai Toms, Frizbee and Gwibdaith Hen Frân. The local alternative music training company Gwallgofiaid now has over 12 bands under its umbrella based at their Centre 'Cell' at the Old Police Station in Park Square. The Centre has 5 rehearsal rooms, a 24 track studio and Cwrt performance space.

Wikipedia entry

Betws-y-Coed



Are the depositional landforms around Llyn Llydaw mainly lodgement or ablation in origin?



Are the depositional landforms around Llyn Llydaw mainly lodgement or

ablation in origin?



Are the depositional landforms around Llyn Llydaw mainly lodgement or ablation in origin?

Expectations?

From this, we can make some predictions regarding ablation till features compared to lodgement features:

- Clasts would be more angular
- They would not be orientated in the direction of ice flow
- There would be less fine material in the matrix
- Deposits would be less compacted

What about their appearance?

Landform appearance

What differences might be apparent? How could the landforms be described? What sort of data is it?

Sediment sampling – till fabric analysis

You can't measure every clast in every landform, so you will need to devise an appropriate sampling method.

A useful piece of equipment would be a quadrat:





How could this be used to select clasts? How many clasts should you aim to measure? What should be considered in making this decision?

Measuring sediment angularity/roundness

There are a number of different techniques for describing the characteristics of coarse sediment (finer sediment – sand, silt & clay – needs to be sieved). The Field Studies Council has some useful details:

(https://www.geography-fieldwork.org/a-level/coasts/low-energy-coasts/data-analysis/)

We're only going to consider roundness, for which there are two main methods:

Powers Index of Roundness

Cailleux's Roundness Index

How could such data be presented and analysed?

Powers' Roundness



Pro: quick and easy

<u>Con</u>: subjective; data in categories (so less easy to process)



https://www.researchgate.net/figure/A-new-roundness-scale-for-sedimentary-particles-after-Powers_fig4_303702743

Cailleux Roundness



(v) Calculating the Cailleux Index

Your raw data for each stone is the radius of curvature (r) and the length of the axis (l). For each stone, calculate Cailleux Index as follows $Ci = (2r/l) \times 1000$.

A perfectly spherical stone would have a Ci of 1000. The lower the Ci, the more angular the stone.

Cailleux Roundness



<u>Pro</u>: a detailed measurement that produces a broader range of values providing possibilities for more detailed analysis, esp. using statistics

<u>Con</u>: more fiddly and therefore time-consuming



Clast orientation

How might this be measured?

How could it be <u>presented</u>?

Are the depositional landforms around Llyn Llydaw mainly lodgement or ablation in origin?



Sediment size distribution

How might this be measured?

What difficulties might there be?

How could these be overcome?

Could this be simply assessed? If so, how?

Sediment compaction

Can this be measured (in the field)?

If so how?

Why might any measurements be unreliable here?

Ice flow direction

What evidence might you look for? How would you measure it? How would you record it?

To what extent is the scree material at Llyn Llydaw larger at the bottom?

Accurate and reliable measurements of clast size is critical for this investigation. Sampling is also needed – what might be done and how many clasts collected?

Measuring coarse sediment size

Techniques for measuring sediment size:



Equipment needed? Issues?

- a-axis = the longest side the a-axis of a person is their height from head to toe
- b-axis = The second longest side the b axis of a person is from shoulder to shoulder
- c-axis = The shortest side The c-axis of a person is from front to back through their belly button

https://www.geography-fieldwork.org/gcse/coasts/coastal-processes/fieldwork/

Measuring coarse sediment size

Measuring volume by displacement:



Equipment?

Issues?

http://homepage.smc.edu/walker muriel/measurements in the laboratory%20Procedure.htm

To what extent is the scree material at Llyn Llydaw larger at the bottom?

Compare data from top with that at bottom – possible analysis techniques

Mean + standard deviation

Dispersion diagrams

Box (and whisker) plots

Mann Whitney u test (used to determine if two sets of quantitative data are significantly different) – sets can be of different sizes but it works best if there is less than 20 in each set

Chi-squared (used to determine the degree of difference between observed and expected data) – data needs to be in grouped frequencies and you should <u>expect</u> at least 5 in each group

To what extent is the scree material at Llyn Llydaw greatest at the bottom?

Mann Whitney u test

Is there a significant difference between the two sets of data?

(NB only use first 20 pieces of data)

Hypothesis, H₁

Null hypothesis, H₀

Calculate the u values for each data set

Discard the larger one

Compare smaller value against <u>critical values</u> for size of data set to determine the <u>significance</u> of the result

Accept/reject null hypothesis

The Physical Fieldwork - 2

To what extent is the scree material at Llyn Llydaw greatest at the bottom?

Statistical Tables: Mann-Whitney U-test

Reject your null hypothesis if your test statistic is below the critical (tables) value

Sample 1	α	Sample 2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3	10%		0	0	1	2	2	3	4	4	5	5	6	7	7	8	9	9	10	11
	5%		-	-	0	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8
4	10%		-	1	2	3	4	5	6	7	8	9	10	11	12	14	15	16	17	18
	5%		-	0	1	2	3	4	4	5	6	7	8	9	10	11	11	12	13	13
5	10%		-	-	4	5	6	8	9	11	12	13	15	16	18	19	20	22	23	25
	5%		-	-	2	3	5	6	7	8	9	11	12	13	14	15	17	18	19	20
6	10%		-	-	-	7	8	10	12	14	16	17	19	21	23	25	26	28	30	32
	5%		-	-	-	5	6	8	10	11	13	14	16	17	19	21	22	24	25	27
7	10%		-	-	-	-	11	13	15	17	19	21	24	26	28	30	33	35	37	39
	5%		-	-	-	-	8	10	12	14	16	18	20	22	24	26	28	30	32	34
8	10%		-	-		-	-	15	18	20	23	26	28	31	33	36	39	41	44	47
	5%		-	-	-	-	-	13	15	17	19	22	24	26	29	31	34	36	38	41
9	10%		-	-			-	-	21	24	27	30	33	36	39	42	45	48	51	54
-	5%		-	-	-	-	-	-	17	20	23	26	28	31	34	37	39	42	45	48
10	10%		-	-			-	-		27	31	34	37	41	44	48	51	55	58	62
	5%		-	-	-	-	-	-	-	23	26	29	33	36	39	42	45	48	52	55
11	10%		-	-		-	-	-		-	34	38	42	46	50	54	57	61	65	69
	5%		-	-	-	-	-	-	-	-	30	33	37	40	44	47	51	55	58	62
12	10%		-	-		-	-	-		-		42	47	51	55	60	64	68	72	77
	5%		-	-	-	-	-	-	-	-	-	37	41	45	49	53	57	61	65	69
13	10%						-	-					51	56	61	65	70	75	80	84
	5%		-	-		-	-	-	-	-		-	45	50	54	59	63	67	72	76
14	10%		-	-		-	-	-		-		-		61	66	71	77	82	87	92
	5%		-	-	-	-	-	-	-	-	-	-	-	55	59	64	67	74	78	83
15	10%		-	-		-	-	-		-					72	77	83	88	94	100
	5%		-	-	-	-	-	-	-	-	-	-	-	-	64	70	75	80	85	90
16	10%		-	-		-	-	-		-		-	-	-		83	89	95	101	107
	5%		-	-	-	-	-	-	-	-	-	-	-	-	-	75	81	86	92	98
17	10%						-	-									96	102	109	115
	5%		-	-		-	-	-	-	-		-	-	-			87	93	99	105
18	10%			-			-	-		-		-						109	116	123
10	5%		-	-	_		-	_		-	-	-	-	-	-	_	-	99	106	112
19	10%		-	-			-			-									123	130
10	5%		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	113	119
20	10%		_	_	_	_	_		_	_	_	_	_	_	_		_			128
20	5%		2	2		-	-			-	-	-	-	-			-	-		127
	0,0																			

To what extent is the scree material at Llyn Llydaw greatest at the bottom?

Chi-squared

Is there a significant difference between the observed data and what would be expected (i.e. a random distribution in this case)?

Hypothesis, H₁

Null hypothesis, H₀

Calculate chi-squared

Compare value against <u>critical values</u> for size of data set

Accept/reject null hypothesis

To what extent is the scree material at Llyn Llydaw greatest at the bottom?

Chi-squared

Group the long-axis data – there should be at least 5 expected values in each class – so if you have 25 stones, have 5 classes. These are your Observed data, O.

Size class	1	2	3	4	5	Row Total
Top of scree slope						
Bottom of scree slope						
Column Total						(Overall Total)

To what extent is the scree material at Llyn Llydaw greatest at the bottom?

Calculating chi-squared

Calculate the expected value (E) for each cell using the following formula:

(row total x column total) / overall total

Give values to at least 1 decimal place.

For <u>each</u> cell you need to compare the observed data with the expected value:

(O-E)² / E

Add these up to give a chi-squared value

Work out the degrees of freedom (don't ask!): (rows-1) * (columns-1)

Now compare these in the <u>critical values table</u>

To what extent is the scree material at Llyn Llydaw greatest at the bottom?

Statistical Tables: Chi-Squared

Reject your null hypothesis if your test statistic is above the critical (tables) value

df	0.1	0.05	0.025	0.01	0.005
1	2.706	3.841	5.024	6.635	7.879
2	4.605	5.991	7.378	9.210	10.597
3	6.251	7.815	9.348	11.345	12.838
4	7.779	9.488	11.143	13.277	14.860
5	9.236	11.070	12.832	15.086	16.750
6	10.645	12.592	14.449	16.812	18.548
7	12.017	14.067	16.013	18.475	20.278
8	13.362	15.507	17.535	20.090	21.955
9	14.684	16.919	19.023	21.666	23.589
10	15.987	18.307	20.483	23.209	25.188
	17.075	10.075	04.000	04705	00 757
11	17.275	19.675	21.920	24.725	26.757
12	18.549	21.026	23.337	26.217	28.300
13	19.812	22.362	24.736	27.688	29.819
14	21.064	23.685	26.119	29.141	31.319
15	22.307	24.996	27.488	30.578	32.801
16	23 542	26 206	28 845	32,000	34 267
17	24 769	27 587	30 101	33 400	35 718
18	25 989	28,869	31 526	34 805	37 156
19	27 204	30 144	32 852	36 191	38 582
20	28 412	31 410	34 170	37 566	39 997
20	20.412	01.410	04.170	07.000	00.007
21	29.615	32.671	35.479	38.932	41.401
22	30.813	33.924	36.781	40.289	42.796
23	32.007	35.172	38.076	41.638	44.181
24	33.196	36.415	39.364	42.980	45.558
25	34.382	37.652	40.646	44.314	46.928
		~~~~			
26	35.563	38.885	41.923	45.642	48.290
27	36.741	40.113	43.194	46.963	49.645
28	37.916	41.337	44.461	48.278	50.993
29	39.087	42.557	45.722	49.588	52.336
30	40.256	43.773	46.979	50.892	53.672



#### A brief explanation about significance testing:

With some statistical tests (like Chi-squared, Mann Whiney and Spearman's Rank) it is possible that a result could have occurred by chance. Therefore it is necessary to determine what this probability is – i.e. the significance of the result.

In most cases, a probability of 10% (or 0.1) that a result could have occurred by chance is considered to be too great a risk and so the null hypothesis could <u>not</u> be confidently rejected.

The lower probability (e.g. 5% or 0.01, for example) the more significant the outcome and so the greater the confidence that rejecting the null hypothesis would be the right conclusion to draw.



To what extent has management affected coastal processes at Dinas Dinlle?





To what extent has management affected coastal processes at Dinas Dinlle?





#### **Tidal predictions**

Why important for coastal fieldwork?

Free for 7 days in advance

E.g. <u>https://www.tidetimes.co.uk/</u> Or UKHO (right)



To what extent has management affected coastal processes at Dinas Dinlle?

How can longshore drift direction (and speed?) be measured? Why is it important to do this independently and not just from observation? How will these be affected by longshore drift:

- Clast size and roundness?
- Beach width and gradient?

How to record information about what coastal management is there?

What impact would coastal management have on the above and why (expectations)? How can the impacts be determined at this location?

- Sampling and sample sizes?
- Locations?
- Measurement of clast size and roundness?
- Beach width and gradient?

Accuracy and reliability?

How typical a psammosere are the dunes at Morfa Dinlle?

**Expectations**?

### A Psammosere: coastal sand dunes

What changes are observable as succession proceeds? Why do these change?



Figure 6.2 Cross-section through a typical sand dune showing the development of the vegetation succession.

Ecosystems, p129, M Gillett, Hodder Education, 2005

### A Psammosere: coastal sand dunes

What changes are observable as succession proceeds? Why do these change?



**Cross section through dunes** 

from The Functioning and Management of Psammoseres in Studland Bay, Dorset, GeoFile #710, April 2014

How typical a psammosere are the dunes at Morfa Dinlle?

Data to be collected along a transect going inland from the strandline on the beach Dune profile:

- How? Equipment?
- Precautions?

Vegetation:

- What?
- How? Equipment?
- Precautions?

How typical a psammosere are the dunes at Morfa Dinlle?

Soil characteristics:

- What?
- How? Equipment?
- Precautions?

Wind speed:

- What?
- How? Equipment?
- Precautions?

How typical a psammosere are the dunes at Morfa Dinlle?

Secondary data?



Statistics based on observations taken between 12/2015 - 10/2017 daily from 7am to 7pm local time.

https://www.windfinder.com/windstatistics/foryd bay caernarfon

#### How typical a psammosere are the dunes at Morfa Dinlle?



#### Statistics based on observations taken between 12/2015 - 10/2017 daily from 7am to 7pm local time.

https://www.windfinder.com/windstatistics/foryd_bay_caernarfon

#### How typical a psammosere are the dunes at Morfa Dinlle?

Data presentation: Kite diagrams



How typical a psammosere are the dunes at Morfa Dinlle?

Data analysis:

- Correlation?
- Are changes expected to be <u>linear</u>?