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Examiners' Report
June 2018

GCE Geography 8GE0 01

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Introduction

This is the second year of examinations for 8GE01. This paper saw the continued assessment of physical sciences ideas, testing knowledge of tectonics, with a choice between glaciation and coastal landscapes. Candidates have to respond to unfamiliar fieldwork scenarios, which this year focused on footpath erosion in both glacial and coastal environments. Candidates were also asked to assess their own primary fieldwork techniques, as well as look at the synoptic links between physical geography processes in New Zealand.

Question 1 (a)

This item posed few difficulties for candidates, with most answering tsunami, and some referring to earthquakes.

Question 1 (b) (i)

This item was generally answered well. Most candidates had taken note of the advice in the June 2017 report and made clear comparative statements, with reference to more economic damage after 2006, or the highest/most significant losses occurring after 2006, as well as increased fluctuation. Occasionally some students offered explanations and these are not necessary for a 'Compare' question and just use up time. In the best responses there was clear use of comparative vocabulary, and candidates recognised the need for a comparison before and after 2006, rather than commenting on the entire graph. Centres should remind candidates that the use of data does not constitute a second mark in the new AS exams.

(b) Study Figure 1 in the Resource Booklet.

(i) Compare the economic damage caused by tectonic hazards before and after 2006.

(2)

economic cost were generally more expensive after 2006 with a spike in 2011 which was the most expensive reported hazard. 2015 however had the smallest economic cost.

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Examiner Comments

In this example the candidate has correctly identified that costs are more expensive after 2006. The second comment about the spike in 2011 is true for the graph in its entirety.

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Examiner Tip

Remember compare questions require comparative language.

After 2006 economic damage is generally higher with 2011 having the highest economic damage. Also before 2006 not every year had reported economic damage but after 2006 every year did.

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Examiner Comments

Two clear comparisons have been made in this response 1 - higher/highest and 2- none before 2006.

Question 1 (b) (ii)

Most candidates were able to make sensible suggestions for the difference in economic damage. Most candidates focused on development and associated costs, whilst others wrote about increased population size and the development of more infrastructure and more expensive buildings. A few candidates identified an increased frequency of high magnitude events (and indeed this particular time period had several significant tectonic events, e.g. Haiti, Iceland volcano, Japan EQ and tsunami), and developed this idea to write about a real event. As with June 2017, a significant number of candidates managed to extend their suggestion to achieve 3 marks and in some cases had multiple suggestions instead. Candidates are reminded to make one suggestion and develop this with two follow-up explanatory points which could include some exemplification from their own knowledge.

(ii) Suggest **one** reason for the differences shown.

(3)

~~Technology has developed~~ Population has increased majorly, therefore the tectonic hazards are destroying more homes and infrastructure, after 2006. As population has increased ~~there is~~ population density has also increased meaning a place that is affected has more buildings to be destroyed.

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Examiner Comments

This response correctly identified population as a possible explanation, and went on to explain how that would result in more (dense) infrastructure as a result.

ResultsPlus
Examiner Tip

Remember to develop the explanation twice (or exemplify it) after making a suggestion.

(ii) Suggest **one** reason for the differences shown.

(3)

After 2006 there may have been ~~higher magnitude~~ tectonic ~~de~~ hazards of a higher magnitude, higher magnitude means more economic loss because infrastructure is more likely to be destroyed, and a larger areal extent means ~~e~~ more areas are affected and more money is lost, also it will cost more money to reconstruct.

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Examiner Comments

This response scored 3 marks - correctly suggesting a higher magnitude, and developing that explanation by writing about how more infrastructure would be affected, over a larger area.

Question 1 (c)

1c was generally answered well, showing many candidates had a good understanding of how volcanic hotspots form because of mantle plumes and away from plate boundaries. Despite this, weaker candidates did not distinguish between volcanoes and hotspot volcanoes or, in some cases, wrote about composite volcanoes instead. Other weaker responses did not extend the initial explanation, e.g. referring to ideas about magma burning thin crust without any reference to why (e.g. a mantle plume). Stronger candidates tended to write clear two-step explanations (with the strongest able to do this twice) by covering a broader range of characteristics, particularly about the movement of the hotspot away from the initial plume leaving island chains.

(c) Explain **two** characteristics of volcanic hotspots.

(4)

1 They have chains of volcanoes the & some dormant some will be active

2 They're often explosive as they form & tall composite volcanoes.

ResultsPlus
Examiner Comments

This response only scored 1 mark, offering a chain of volcanoes as a characteristic cause of hotspots. The second idea was not developed into an explanation so did not score any marks.

(c) Explain **two** characteristics of volcanic hotspots.

(4)

1 Volcanic hotspots occur within plates and not at boundaries. This occurs due to Magma rising and melting through the Crust

2 hotspots form basaltic volcanoes which are flat. They have runny lava which spreads abo before ~~dying~~ solidifying.

ResultsPlus
Examiner Comments

This response scored 4 marks - correctly explaining two characteristics and developing those explanations.

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Examiner Tip

Remember that a key word is not an explanation or part of one. A mark is awarded for a process or idea being explained.

Question 1 (d)

Similarly, this question assessed candidates' understanding of the processes that lead to volcanic eruptions. The better answers focused not only on describing differences but also explaining, for example, differences in lava type, plate boundary type; the very best were able to link differences in silica and mineral content to type of lava and build-up of gas and material in an eruption. Sometimes candidates wrote ideas that were unexplained or left unrelated to the question (e.g. strength of seismic waves, or conservative plate boundaries), or they muddled up the two types of volcanoes, or plate boundary, or silica content and lava type. Centres can help prepare students for both 4 and 6 mark 'explain' questions by developing key-chain explanations. Without this, answers remain very descriptive, (e.g. a contrast between plate boundary types).

(d) Explain why volcanic eruptions vary in their magnitude.

(6)

Volcanic eruptions tend to vary in size due to many factors that have to be taken into consideration for etample volcanic eruptions that are to take plaa on a destructive plate boundary are much more dangerous than ones that are located on top of volcanic hotspots. For example a destructive volcano would be Mt St helens, a huge eruption blasting out of the side of the mountain. & Despite killing around 50 People it was a huge ~~explosion~~. Comparing this too somewhere like Hawaii which is a domed volcano, the magnitude is much less as it is constantly erupting, with fast, liquidy lava where as other volcanoes may ~~to~~ Cause pyroclastic flow ~~for example~~ or big ash clouds for example the icelandic eruption in 2010.

ResultsPlus
Examiner Comments

This response was in level 2 (3 marks). It had some correct ideas, e.g. writing about plate boundary type and the consequences of that for magnitude and type of lava.

(d) Explain why volcanic eruptions vary in their magnitude.

(6)

Firstly, volcanic eruptions vary in their magnitude depending on wether they are caused by a destructive or constructive plate margin. For example, the volcano in Nyaragongo had a VEI of 1, this was because it was caused by a constructive plate boundry, where 2 plates move apart letting magma rise to create new land. This is called a shield volcano, it has low magnitude → Not explosive magma, so it's a calm volcano.

Secondly, on the other hand side, Volcanos in Chile, are caused by destructive plate boundry and have a higher VEI, this is because, a plate (oceanic) is subducting under the plate (continental), leading to the oceanic plate melting. This creates eruptive and viscous magma, which erupts violently, causing secondary hazards such as Landslides, triggered by earthquakes. Therefore Destructive plate boundry volcanoes, have higher magnitudes.

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Examiner Comments

This was a much clearer response, scoring 5 marks. It makes the links between two type of plate boundary, what happens at that boundary and the type of lava and eruption that results. A stronger answer might have also written about silica or gas content of the lava.

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Examiner Tip

Remember keychain explanations are important in physical geography to write good explanations. For level 3 technical detail will always make writing more accurate.

Question 1 (e)

Many candidates were able to distinguish between different tectonic hazards, i.e. predict volcanoes vs. earthquakes. Some extended their explanation of earthquakes to also write about tsunamis and the various warning systems used to measure wave height. Those writing about volcanoes tended to focus on gas emissions and seismic activity.

Better responses went on to show how these prediction and forecasting methods were useful for effective management (e.g. making evacuation plans possible). Stronger answers differentiated between forecasting and prediction and more importantly noted that different types of management are needed for earthquakes, volcanoes and tsunamis. Therefore candidates who showed knowledge of how prediction methods worked in the overall management of hazards (perhaps writing about different stages of the hazard response cycle, or Park model) performed better in this 'assess' question.

The very best responses provided judgements about effectiveness of different management strategies and used well-chosen examples, e.g. the sheer magnitude of the Japan 2011 earthquake outweighing relatively good tsunami management, or details of the modelling done in California and preparations associated with the Shakeout programme, including investment in aseismic buildings - alternatively the eruptions of Mt. Etna, and Mt St Helen's could all be used as examples of good management. These could be contrasted with the Eyjafjallajökull eruption in Iceland, which could be regarded as both effective and ineffective, depending on how the example is used. Crucially it is important for candidates to make judgements about whether management has been effective or not, and this could be measured by number of deaths, costs or the costs associated with any stage of the hazard response cycle.

(e) Assess the effectiveness of prediction and forecasting in the management of tectonic hazards.

(12)

The ability to predict a tectonic hazard allows a government to plan and prepare, it allows them to build infrastrucure to withstand the hazards effects, it allows them to come up with evacuation routes and allows them to come up with adaptation to minimise the damage.

Scientists have developed technology and ways in which we can predict volcanic eruptions. This allows the most vulnerable areas to be evacuated, It also allows governments to prepare, forexample ~~diggig~~ digging lava and lahar channels, allows it to be directed away from settlement reducing deaths and economic ~~dama~~ damage. It allows governments to adapt their infrastructure, forexample having house with very steep roofs means that if ash was released it would not be able to build up on the roof, and cause the houses to collapse, this again reduces social and ~~econi~~ economic damage.

There is no way in which we can predict an earthquake, however if a country is aware that it is located on a conservative plate,

it gives it the ability to prepare, forexample Japanese governments ~~on~~ are aware of the possibilities ~~like~~ of being hit with an earthquake. This has allowed the to develop earthquake buildings, and have ~~reinforced~~ reinforced ~~existing~~ existing infrastructure, they have come up with evacution routes and hold regular drills to educate their population. These adaptation are able to reduce social, ~~and~~ economic and environmental effects.

A tsunami is generally caused by an earthquake which is unpredictable, therefore tsunami is unpredictable, but an early warning system allow vulnerable people to be evacuated.

ResultsPlus
Examiner Comments

This is a good level 2 response that scored 6 marks. The candidate started to write about different prediction and forecasting strategies, and thought about the nature of prediction/forecasting and where the limitations were.

It's important in 12 marks essays to pick the right details from your case studies to support your argument - in this case explaining detail about prediction/forecasting and how that helped management - rather than everything you know about tectonic hazards.

~~ef~~

Yes	no
California	Japan tried

2005 prediction

Kashmir, California, Japan (Tohoku)

(e) Assess the effectiveness of prediction and forecasting in the management of tectonic hazards.

(12)

Prediction and forecasting can be very effective because it allows countries to decide how to go about mitigation and which ~~prevent~~ defensive measure they should ~~be~~ put in place. ~~Good prediction and forecasting means~~ This means better protection against the hazard and this increases capacity to cope.

However prediction and forecasting are not always effective if the magnitude of the event overwhelms the capacity to cope, for example Tohoku Tsunami in Japan overwhelmed the sea walls which had been put in place (because they had predicted that a tsunami may occur), and it resulted in huge economic and human loss. ~~are aware a hazard may occur so they can~~

On the other hand, prediction ~~can~~ means that people in developed countries can get insurance (if they know a hazard event is likely) - which is a means of protection against financial loss. For example in California more people have earthquake insurance than in all other states in America. California also have super-computers which can create virtual models forecasting disasters and disaster impacts. This is ~~very~~ highly effective ~~as it~~ in the management of hazards as it means that ~~sci~~ engineers can plan their defences ~~that~~ with more knowledge. ~~on how to build~~ (→ So when the hazard occurs the defences will be better than

if they had been designed & built with no knowledge of potential impacts.

In my opinion, ~~the~~ prediction and forecasting is effective in the management of tectonic hazards, because even if defences are overwhelmed, at least prediction allows for the community to be prepared (e.g. ~~pe~~ store of emergency food & water supplies, insurance, disaster plan) and for evacuation to ~~be~~ take place. For example if the earthquakes in Bam and Kashmir had been predicted, people could have been evacuated so there would still be economic loss but much less human loss.

ResultsPlus
Examiner Comments

This is a much stronger response (level 3) scoring 11 marks. Although it was a little bit limited in the breadth of types of tectonic hazard, the judgement is clearly based on the effectiveness of prediction and forecasting and the size of the event. It does good assessment and addresses the question. The examples were well chosen and correct detail helped to support the judgement.

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Examiner Tip

Work through every 12-mark tectonics questions from the Specimen papers and June 2017 and 2018 papers. Work out which examples you could use for each of them. Then really get clear details in your head about the most useful factual knowledge that would help answer the questions.

Question 2 (a)

2a was, surprisingly, poorly answered. Many candidates wrote various responses that were not mass movement (e.g. precipitation, plucking, basal slip). These tended to be processes or factors that contributed towards mass movement. Candidates who correctly noted the phrasing process of identified avalanches or simply mentioned landslides and rockslides.

Question 2 (b) (i)

2bi was problematic for many candidates. The mark scheme gave some flexibility for the accuracy of reading from the graph, but checked that students correctly identified the difference between the two figures, and then divided that result by the first figure (12.2-12.4) to correctly calculate a percentage change. Candidates were not penalised for an error made in the subtraction if they went on to to calculate a valid percentage change. However aside from many candidates doing a wrong subtraction, they

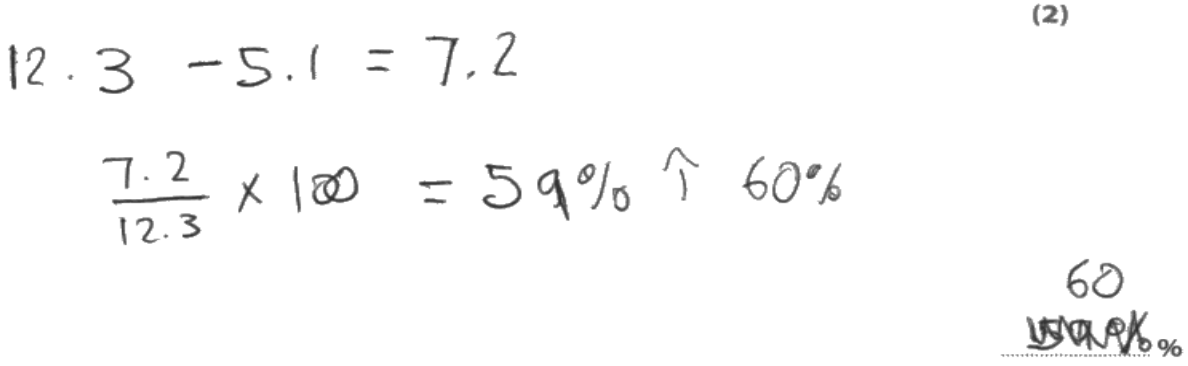
- subsequently did not use the subtraction to do the percentage change calculation
- or then used the wrong figure to do the division
- or didn't know how to calculate percentage change.

(b) Study Figure 2 in the Resource Booklet, which shows past and predicted changes in the global permafrost area.

(i) Calculate the percentage loss of permafrost area between 1900 and 2100.

Show your working.

(2)



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Examiner Comments

This example scored one, because the calculation of percentage change was correct (using the first figure, 12.3). However reading 12.3 from the graph was too high and outside of the acceptable range on the mark-scheme.

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Examiner Tip

Check the instructions on maths skills questions - in this case to show your working.

Question 2 (b) (ii)

2bii posed fewer problems. Most candidates suggested that permafrost melts and provided at least one, if not two, extension points. The most popular ideas related to positive feedback cycles created by the release of methane, or flooding created by the release of water (although this was harder for candidates to develop). Others referred to changes to biodiversity, and sometimes subsidence and solifluction (and associated impacts on human activity). The occasional poor response confused periglacial with ice/glacial melt, or talked more generally about sea-level rise.

(ii) Suggest **one** way in which these changes may affect periglacial landscapes.

(3)

Periglacial landscapes with decrease in size as the ground thaws. This will release more methane into the atmosphere and contribute to global warming. This will further and the thawing of permafrost.

ResultsPlus
Examiner Comments

This was a good answer scoring 3 marks. It correctly suggested that permafrost would melt, and then went on to show that would release methane and, in turn, result in more global warming, i.e. a positive feedback cycle.

ResultsPlus
Examiner Tip

Keychain explanations are useful for shorter items too.

(ii) Suggest **one** way in which these changes may affect periglacial landscapes.

(3)

The permafrost landscape will change from a continuous layer of permafrost to a discontinuous layer, and finally to a sporadic layer of permafrost. This could be due to the increased ablation, which causes increased solifluction, which speed up the melting of the periglacial landscapes.

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Examiner Comments

This answer scored slightly less (2 marks), having only identified a change from continuous to discontinuous and then, as a result, more solifluction.

Question 2 (c)

In 2c, although some candidates did not focus on the idea of present-day periglacial climate, most were able to provide clear answers to this question and chose to write about high latitude and high altitude. The majority extended one of these points to write about cooler temperatures but were unable to get 4 marks because the explanatory point was too similar for both ideas (perhaps not noting that latitude changes the intensity of sunlight reaching different locations). Weaker candidates tended to write about glaciers melting, or temperatures in general, without referring to the idea of location. Others confused the question with a need to write more generally about the causes of climate change.

(c) Explain **two** reasons for the location of present day periglacial landscapes.

(4)

1 The last glacial Maximum will explain why some periglacial landscapes are where they are.

2 Global warming is causing some of the periglacial landscapes to change place, as the glaciated landscapes retreat and melt, the periglacial ones move across with it. Some are now even turning paraglacial.

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Examiner Comments

This response scored 2 marks, one for each reason (global warming, and replacement of ice). Neither point was extended clearly enough.

will fuel the increase loss of permafrost in periglacial regions.

(c) Explain **two** reasons for the location of present day periglacial landscapes.

(4)

1 They are generally in the higher latitude areas near the arctic Circle because the Earth is circular so the suns rays hit the higher latitudes less directly because they are curved away from the sun promoting colder temperatures and so periglacial landscapes.

2 Altitude also affects periglacial landscapes. 100m upwards translates to 1°C decrease in temperature because it is further away from the hot core so this promotes colder periglacial environments

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In contrast, these were two nicely extended points.

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Examiner Tip

Remember to extend each point in 4 mark 'Explain 2 reasons'.

Question 2 (d)

The wording of the specification suggests long-term causes of climate change include not only Milankovitch cycles, but also solar output variation and volcanic eruptions. Nevertheless the vast majority of candidates chose to write in detail about Milankovitch cycles and offered excellent explanations of the 3 different timescales and the impact they would have on temperature change. The very best answers showed the interaction between the cycles, but this was not vital for full marks. Weaker candidates tended to make the mistake of explaining current global warming, or provided a list of reasons without explanation or in some cases confused Milankovitch cycles with sunspot cycles.

(d) Explain the natural causes of long-term climate change.

(6)

One natural cause of long term climate change is global warming. Often caused by volcanic eruptions global warming is the process of ash and other small particles entering the atmosphere and reducing the amount of solar radiation that reaches the earth thus cooling it.
A second cause of long term natural climate change is of increased volcanic activity. Increased volcanic activity can lead to an increase in temperature due to the gases released during eruptions increasing the green house effect.
A third way in which natural cause of long term climate change is the ~~ice~~ albedo effect. This is the reflection of solar radiation due to polar ice coverage. overtime this can reduce global temperatures due to large amounts of radiation being reflected.

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Examiner Comments

There are a number of ideas suggested here, not all of them have been fully developed. The volcanoes point is inaccurate and the third idea is not so relevant to this question. It scored 3 marks (level 2).

(d) Explain the natural causes of long-term climate change.

(6)

Milankovitch cycles result in changes to the orbit of the earth around the sun. ~~It varies between eccentric and~~ The orbit changes every 100,000 years So when the earth is on an eccentric orbit its closer to the sun So the intensity of heat energy absorbed is higher than when the orbit is more round and the intensity is less. As well as this, the tilt of the Earth itself will effect how hot the atmosphere becomes as when its tilted towards the sun it gets close and vice versa, the same with the orbit. Another natural cause of Climate change will be the Sun spots activity on the sun ~~when they~~ which changes every 11 years. The more Sun spots on the sun the hotter it gets and increased Solar out put means the rays absorbed are hotter making the atmosphere hotter contributing to Climate change as there's more evaporation of oceans and more monsoons and tropical rain storms.

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Examiner Comments

This response was in level 3 (6 marks). There were a range of ideas, all of which were correctly linked to temperature change.

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Examiner Tip

Another approach to 6 mark explain might be to develop a key chain explanation for 2-3 different causes or factors.

Question 2 (e)

There were a variety of responses to 2e, a 12-mark 'assess' question. Most candidates were able to distinguish between economic and environmental value, and most of these wrote about sensible threats to the landscapes, particularly from tourism, climate change and resource extraction, e.g. deforestation. Many candidates also wrote about oil extraction and in many cases it seems they were implicitly referring to periglacial landscapes, which is not the focus of the question. Centres are reminded to distinguish between 'Glacial landscapes' and 'Cold Environments' in general. Where these activities could plausibly have occurred in glacial landscapes, candidates were credited. Better answers also recognised that glacial landscapes can be both active and relict (e.g. tourism in Yosemite National Park was an interesting example used by a number of candidates). The best responses remembered to make judgements, either based on the relative threat to either economic or environmental value (i.e. assessing the threats against each other), or in some cases discussing whether the threat was greater to either relict or active landscapes. Either approach was successful.

(e) Assess the threats to the economic and environmental value of glacial landscapes.

(12)

Glacial landscapes are fragile due to the nature of area and are often exploited for resources and tourist attractions which can put a strain on the environment as it becomes disturbed.

~~Alaska~~ Areas such as Alaska ~~the land~~ and Green

Areas such as Alaska are economically valuable to TNCs as oil can be found there however this poses a threat to the surrounding environment as the ability to transport the oil is restricted so they built a pipe to move it from the North to the South but the ~~pipe~~ which crosses the path of the deers migration route. The pipe is also very close to a conservation area of the animals and ~~damming~~ others. The drilling for oil may disrupt the habitat causing increased numbers of death of animals which could inturn affect the food chain of the locals.

Another environmental threat experienced by glacier landscapes is the melting of them due to global warming and the enhanced green house effect. for example melting of the ice caps results in polar bears spending more time in the sea where requires energy, the colder seas mean less fish so polars bears decline and fish migrate else where. The potential for any discoveries of different types of bear

or how they came about will be lost with the extinction of them.

As well as this global warming has an economic effect on glacial landscapes as ~~people~~ local people are unable to hold tourist ~~events~~ for example the Northern lights as people are unable to visit due to melting ice. This puts a risk on the local people as they're unable to use the income for goods and products or trade to survive.

Glacial Landscapes Such as Austrian Alps will face threats as melted Snow will mean the tourist population who go to Ski will decrease in turn affecting the economy and local businesses.

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Examiner Comments

This response has got some relevant points, and the ideas about the impact on the environment are particularly clear. The ideas about the economy were less clear. There are sections which feel like the candidate is not writing about a glacial environment, although this focus is clearer at the end. Overall it scored 7 marks (level 2).

Question 3 (a) (i)

3ai was generally answered well. Most candidates were able to identify two differences between the kite diagrams and use this to identify impacts of footpath management. The strongest candidates tended to write more clearly about the changes either to the sides of the footpath (e.g. more even coverage) or the more clearly defined path. Some candidates confused the diagrams and incorrectly used information from the kite diagram of the unmanaged footpath. Others got distracted by the additional gaps in the unmanaged section and this led to confused statements about the impact of one single pathway. Weaker candidates were unable to interpret this type of resource, or considered the general impacts of footpath management, rather than responding to the fieldwork resource.

See below

3 (a) Study Figure 3 in the Resource Booklet.

A group of students collected data about footpath erosion near Easedale Tarn, a fragile, glaciated landscape in the Lake District.

They measured vegetation cover across a transect on:

1. a managed footpath
2. an unmanaged footpath.

They presented their findings as two kite diagrams.

(i) Identify **two** impacts of footpath management.

(2)

1 More vegetation ~~More vegetation~~ cover across the footpath when managed.

2 Less people going off the footpath when the area is being managed.

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Examiner Comments

See below

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Examiner Tip

This was a good example of a response that scored 2 marks because of 2 clear impacts identified from the two kite diagrams.

Question 3 (a) (ii)

3aii attracted a variety of responses and most candidates responded well to the fieldwork scenario - a key message from the June 2017 series. Most chose to write about the reduced risk to, or from, walkers. The mark scheme reflects this variety, and reminds centres of the importance of making, and then developing, one suggestion that reflects the information given. A few candidates confused the impact of walking with destabilisation to the glacier, rather than the footpath itself.

(ii) Suggest **one** reason why footpath management is necessary in this fragile glaciated landscape.

(2)

Because there may be rare plants only found in glaciated landscapes that is need to be conserved so footpaths are made to ensure that no valuable flores is lost.

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Examiner Comments

This is a good example of a clear response to the fieldwork scenario - 2 marks were awarded for rare plants and conservation.

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Examiner Tip

The best responses to all 'Suggest' questions are based clearly on the scenario and the information provided.

Question 3 (a) (iii)

3aiii was poorly answered by many candidates - the vast majority of whom provided quantitative fieldwork techniques. Centres are advised to look at page 53 in the AS Geography specification, where a list of skills, both quantitative and qualitative are outlined.

Question 3 (a) (iv)

There were mixed responses to 3aiv, with many candidates not distinguishing between statistical methods and sampling strategies, nor able to identify any specific statistical methods. The scenario described in the question referred to relationship in order to encourage candidates to write about Spearman's Rank. However, some other tests (e.g. T-test and Mann-Whitney U) were also acceptable; it is possible that fieldwork data could have been set up to compare the two footpath section.

The best responses, having identified a specific test, clearly understood how that test could be applied to the fieldwork scenario, as well as the importance of significance in deciding whether to accepting the hypothesis or not.

Although mathematical skills are still relatively new to GCSE and A-Level courses, centres need to help candidates by distinguishing between the role of Spearman's (Relationship), T-test (Comparison), and Chi^2 (categories of data).

Explain how the use of a statistical method would help their investigation about footpath erosion.

(4)

Statistical methods such as spearmens rank would help as theyre results would be much more accurate after doing this. Not only that but if they had done two more sets of data they would have been able to do that. Making their results much more accurate and reliable. Meaning that their null hypothesis could be agreed or disagreed with.

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Examiner Comments

This response scored 2 marks. It identified Spearman's Rank as an example of a suitable test, and went on to show how it could be used to decide whether to accept the null hypothesis. The comments about accuracy and reliability were not suitable explanation for this question.

Explain how the use of a statistical method would help their investigation about footpath erosion.

(4)

~~First~~ Spearman's rank or correlation can be used to see the relationship between the width of the foot path and the distance from the car park. Data must be ranked first so, the distance of the car park and the width of foot path should be ranked from ~~the~~ highest to lowest or, ~~a~~ unpaired t-test can also be used to see the significant difference between width of the foot path and distance from the car park. ~~It the is a significant~~

if the spearman rank test was positive, then there is a positive correlation meaning as the distance from the car park increases, the footpath width increases

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Examiner Comments

This response was slightly better, scoring 3 marks. Again, Spearman's Rank has been identified, along with the importance of considering relationship (distance from the car park). Although there was no additional mark for writing about the t-test, there was an additional mark given for writing about the importance of considering the significance of the test result.

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Examiner Tip

Know your statistical tests and type of geography! Spearman's Rank does relationships between two sets of data. T-test helps look for difference between two sets of data.

Question 3 (b)

3b was answered relatively well. Many centres have noted the advice offered in the June 2017 series and many answers now began with a clear statement of a geographical question. The best outlined a hypothesis to be tested or question to be answered. The majority of fieldwork was seemingly focussed on the extent of glaciation in Pembrokeshire. Many candidates were able to talk about different primary fieldwork methods, e.g. Callipers, Peter Keanes Dichotomous Key and sediment roundness. Better answers commented both on accuracy and reliability, as well as reaching a clear judgement about whether the weaknesses of different methods stopped them from answering the question. The very best responses also considered problems with sampling, as well as the impact of the methods on the data, and what wider geographical factors were not considered by the fieldwork techniques. Weaker answers confused the terms accuracy and reliability, or did not offer plausible reasons for either.

(b) You have carried out **primary fieldwork** to investigate glacial landscapes and change.

Assess the accuracy and reliability of the **primary data** that you collected as part of your geographical investigation.

(9)

Geographical enquiry question:

What do ~~the~~ ~~test~~ glacial landforms tell us about the direction of ice movement in Snowdonia?

We collected data about the orientation of striations around Cwm Idwal. We look at known sites where there are striations and measured the orientation using compass. To make our readings more accurate, we ~~put a~~ lined up a small box lid with the striation and put the compass against to make sure it was straight. This made the reading more accurate than if we'd laid the compass on the rock as the rock was not flat.

~~We~~ We also went to a roche moutonee in the Nantfranc valley. We measured the lengths, width and height of it. These results may be less accurate as it was raining heavily and very windy so the tape measure wouldn't stay still. It also snapped so we had to hold it together making the measurement less reliable.

ResultsPlus
Examiner Comments

This response scored level 2 (5 marks). It correctly focuses on accuracy, and uses methods that would be relevant for the fieldwork scenario that's been identified. Helpfully, it shows how these would help answer the enquiry question. There is some confusion about accuracy and reliability.

ResultsPlus
Examiner Tip

Remember the difference between accuracy and reliability: **A**ccuracy is the **A**ctual Score. **R**eliability is can you **R**epeat it.

(b) You have carried out **primary fieldwork** to investigate glacial landscapes and change.

Assess the accuracy and reliability of the **primary data** that you collected as part of your geographical investigation.

(9)

Geographical enquiry question: How reliable is the evidence for the last glacial maximum reaching Pembrokeshire

In the investigation we collected information about the average width of clasts in each site along the A-axis. To do this, we measured 30 clasts. This is a reasonable sample size, so the odds that any anomalies entered the data are low. This aids reliability accuracy. We cannot be sure that the A-axis measured was actually the A-axis though, as the rocks were embedded in the cliff face and could not be removed. For this reason, the wrong A-axis may have been measured, making it inaccurate.

The roundness of clasts was judged using a Powell index, and this could have been unreliable as the method is subjective to a degree. This was accentuated by the fact that there was no sampling method for the clasts, so each rock could have been measured more than once by multiple groups at the site, and the largest or most eye-catching rocks could have been candidates for this happening. This makes data collected inaccurate and unreliable, as another set of students could have ended up with very different results.

We used a Peter Keehei test for assessing what landform each unit at each site was. This was accurate and reliable, as the

correct answers were revealed by locals who knew the area's glacial features, so the results were true to reality (accurate) and would have been the same whereas they had been collected (reliable).

The accuracy and reliability of our results was likely not greatly detrimental to our conclusions, but certainly there were elements that could have been improved, for instance by telling classmates of the diff to measure them.

ResultsPlus
Examiner Comments

This is a much stronger response - very clear about the differences between accuracy and reliability. It is also clear about how their approach to data collection made both better or worse. There is also a little bit of judgement at the end of their writing, which helps confirm this is a strong level 3 response (9 marks).

ResultsPlus
Examiner Tip

Strong fieldwork enquiry questions make it very easy to make connections between your descriptions of fieldwork and the 'assess' element of the question.

Question 4

Both question 4 and 7 posed very different challenges to the June 2017 scenarios. Candidates were asked to concentrate on the interrelationships between two physical sets of processes in the formation of distinctive landscapes. Many candidates had learnt to try and make clear judgements about whether tectonics was more important than weather conditions. However a good number seemed to confuse weather with weathering; although weathering and subaerial are important, the principal focus of the weather conditions was for accumulation in the glacial uploads of the Alps. It was good to see most candidates were able to explain the context.

Weaker answers tended to just use evidence from the booklet to show how tectonic uplift helped establish the context for glacial conditions. Better responses were guided by a broader range of evidence to present a case for glacial processes being more important. The very best noted that what happens in upper glacial valleys will be different to the lower, and therefore the relative balance of tectonic and glacial importance also differs. These answers were more synoptic because they showed wider knowledge from across the course.

Similarly to June 2017, most candidates seemed to be left with a decent amount of time to answer this question.

4 Study Figures 4a, 4b, 4c and 4d in the Resource Booklet.

Evaluate the importance of tectonic processes and weather conditions in creating distinctive glacial landscapes in New Zealand.

(16)

The ~~two~~ essays as tectonic processes and weather conditions are both very important in creating the distinctive glacial landscapes in New Zealand.

One way in which tectonic processes are important in creating the distinctive glacial landscapes in new zealand is due to tectonic uplifting. Mt Tasman is a prominent peak that is in the alpine fault as figure 4c shows. It grows in height due to tectonic uplifting caused by this boundary. It grows by 5-10mm/year due to this. This is therefore a distinctive glacial landscape that has been caused by tectonic processes making them relatively important.

One way in which tectonic processes and weathering are not important in creating distinct glacial landscapes is due to glacial erosion. Figure 2a shows that the four glaciers move up to 1m downhill per day which causes rapid glacial erosional processes and therefore rapid creation of new glacial landforms. In this terrain neither tectonic nor weathering

processes are relevant in causing different glacial landforms.

A one way in which weathering is important in the formation of glacial landforms in New Zealand is due to the high amounts of precipitation the area receives. The mountain ~~ranges~~ ranges are north westerly winds that bring 10,000mm/year of precipitation. This causes large amounts of weathering which can eventually lead to glacial landforms forming. However this is not hugely relevant as it is not directly acting out as glacial landforms.

A second way in which glacial landforms are not formed by weathering or tectonic processes is due to glacial deposition or subaerial processes such as freeze thaw shown in figure 4 d.*'

overall tectonic processes are far more important in creating glacial landforms in mountainous but glacial flow and internal glacial processes are more significant than weathering.

*' this shows that the ~~→~~ not ~~weathering~~ weathering / tectonic processes are still being

the formation of glacial landforms they make interact glacial processes relevant.

ResultsPlus
Examiner Comments

This is a reasonable response to the question. The second paragraph shows the importance of tectonics, and the third concentrates on glacial processes and then the fourth on the importance of latitude for precipitation and accumulation. Overall the point being made is that glacial processes are slightly more important, and evidence is used to back up this idea. But the geographical interpretation of the resource booklet information was not secure enough for it be level 3 - it scored 8 marks.

4 Study Figures 4a, 4b, 4c and 4d in the Resource Booklet.

Evaluate the importance of tectonic processes and weather conditions in creating distinctive glacial landscapes in New Zealand.

(16)

The glacial mountains in New Zealand are prone to tectonic hazards, but they also may be somewhat responsible for their distinct formation. Due to the fact that the South Alps lies along a fault could be an indication that the mountains were caused by a destructive plate boundary. The Australian plate and the Pacific plate have two different boundary types - destructive and transform. The transform boundary wouldn't really contribute much to the creation of the mountains and would only create earthquakes, however the subduction at the destructive boundary would cause the oceanic plate to be pushed down, forcing the continental plate to be pushed up. The increases in altitude would cause a change in the environmental lapse rate increasing snowfall and creating the ice caps present on the southern Alps. A statistic states that Mount Tasman, a pyramidal peak grows 5-10mm a year due to tectonic uplifting, which is another piece of evidence to support the fact that the landscape was created by tectonic processes.

Although there is proof of this it is more likely that glacial action was the cause of the distinct to New Zealand landscape. For example, there is evidence of many different glacial landforms, such as the pyramidal peak of Mt. Tasman, which is surrounded by cirques, lots of g U-shaped valleys and glacial troughs which could have only been created by a glacier, specific erosion features which could have only been created by glacial erosion and deposition landforms such as kames, erratics and glacial till. Combining this with the fact that the prevailing North-West winds deliver large amounts of precipitation to the Southern Alps per year, totalling 10,000 mm/year, and it's clear to see glaciers play a huge part in the landscape. Within this single mountain range there are 3000 glaciers that all create their own erosional and deposition features.

In conclusion, it can be assumed that tectonic processes where initially the biggest factor behind the creation of the Southern Alps, however the glacial and weather processes accelerated it to a completely new level and as a result they are responsible for why they are so distinct.

ResultsPlus
Examiner Comments

This is a much stronger answer. Based on its interpretation of the resource booklet scenario, it then goes on to bring in own knowledge, covering both tectonics, glacial and weather conditions. This shows synoptic thinking and begins to evaluate the importance of these factors. To get the final mark, it might have thought about different aspects of the valley and shown how glacial processes were important in the lower valley. It was a level 4 response, scoring 15 marks.

ResultsPlus
Examiner Tip

One approach could be to plan an answer to the question before reading the scenario. What might the two sides of the argument be, and then look for the evidence to back-up your ideas.

Question 5 (a)

5a was answered well (considerably better than the corresponding 2a). Most candidates wrote about landslides, rockslides and slumping. Occasionally candidates confused mass movement with longshore drift.

Question 5 (b) (i)

Like 2bi, 5bi was problematic for many candidates. The mark scheme gave some flexibility for the accuracy of reading from the graph, but checked that students correctly identified the difference between the two figures, and then divided that result by the first figure (10-15mm) to correctly calculate the percentage change. Candidates were not penalised for an error made in the subtraction if they went on to calculate a valid percentage change. However aside from many candidates doing a wrong subtraction, they subsequently did not use the subtraction to do the percentage change calculation, or then used the wrong figure, or didn't know how to calculate percentage change.

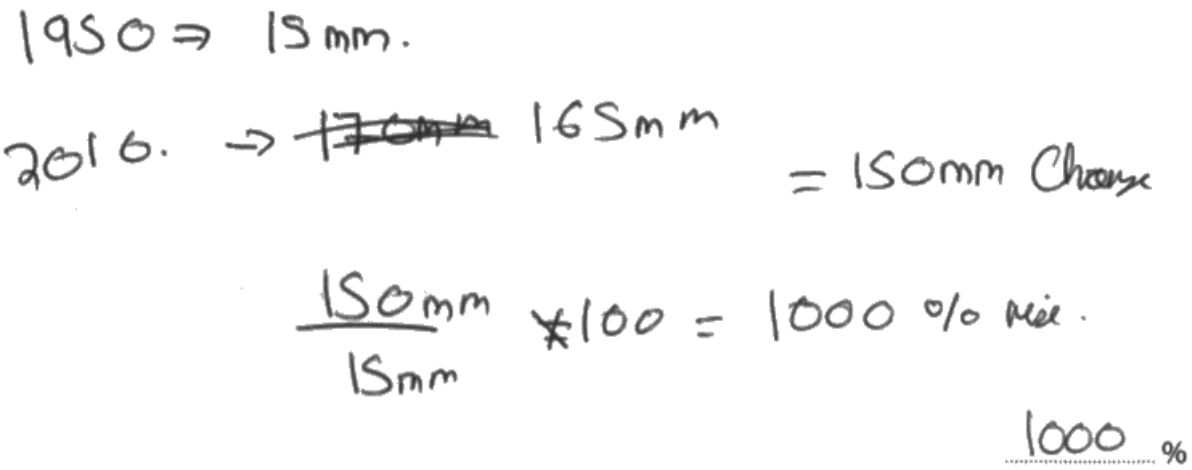
As candidates become increasingly familiar with mathematical skills, hopefully their initial reaction to the graph of this type will be to realise that the increase has far more than doubled (at least a 100% increase).

(b) Study Figure 5 in the Resource Booklet, which shows global sea level changes before and after 1950.

(i) Calculate the percentage sea level change between 1950 and 2010.

Show your working.

(2)



ResultsPlus
Examiner Comments

In this response, the candidate has correctly identified figures from the graph, done a subtraction to calculate the difference and used that to calculate the percentage change.

ResultsPlus
Examiner Tip

Remember that percentage increase still starts from the first figure, in this case the smaller number.

Question 5 (b) (ii)

5bii was answered relatively well. Most candidates correctly focused on eustatic sea-level rise and suggested low-lying areas would be flooded or submerged and this would cause damage to infrastructure. A number of candidates were unable to identify a 3rd development point (limiting the marks on many responses to 2). A number of candidates focused on the formation of Dalmatian coastlines, including rias and fjords, and were able to achieve the 3rd mark by being clear about prior processes that distinguished between these landforms. A few students suggested more erosion, but were unable to link this to how waves would break higher.

On a different note, it was noticeable that many candidates rewrote the question, or began their answer with a preamble that did not clearly make a suggestion about the change sea-level rise would bring. Occasionally candidates made more than one suggestion, in which case only the better chain of ideas was credited.

(ii) Suggest **one** way in which these changes may affect coastal landscapes.

(3)

An increase in sea level could cause coastal flooding. As sea levels rise, the waves will begin to engulf more and more of the beach causing longer amounts of sediment to be carried away causing a shrinkage in beach size.

Remember that suggestions and explanation need an idea rather than words (e.g. coastal flooding engulfing more and more land)

ResultsPlus
Examiner Comments

This was a typically strong response which scored 3 marks. Coastal flooding was a sensible suggestion and this was extended by writing about sediment being carried away, so the beach is left smaller.

(ii) Suggest **one** way in which these changes may affect coastal landscapes.

(3)

Sea level rise can cause submergent coastlines to form, due to the eustatic change. It will form ianafors like a dalmation coastline. 4*

ResultsPlus
Examiner Comments

See below

ResultsPlus
Examiner Tip

This was a weaker response. Two suggestions had been made and only one could be credited. In this case, **either** the formation of a submergent coast line **or** a Dalmatian coastline. The ideas have not been linked.

Question 5 (c)

As in 5bii, most candidates correctly focused on isostatic rise, and were able to provide clear initial suggestions about low-lying flat land, or the funnelled shape of the landscape. Most candidates were unable to develop these explanations and, as with 1c, the expression of an idea requires more than just a word. Better responses made clearer links to how these factors created a higher flood risk. Weaker answers tended to misread the question and wrote about human factors (e.g. spending money on sea defences), or sometimes focused on rivers with insufficient clarity about why being at a river mouth affected coastal flooding.

(c) Explain **two** physical reasons why some locations are at risk from coastal flooding.

(4)

1 Rising sea levels meaning low lieing land will become covered (bangladesh) because the water level is higher than the land level (Eustatic change)

2 Isostatic Change - Due to ice melting off of some areas after the ice age these areas are raising causing other areas to lower closer to the Seal level meaning more area will begin to be covered in water.

ResultsPlus
Examiner Comments

This is a typically stronger response to the question. The first point only scored 1 mark, and needed to be extended. The second point about isostatic change due to ice melt scored 2 marks because of an extended idea related to subsidence.

ResultsPlus
Examiner Tip

Remember to extend both of your ideas in 'Explain 2' questions.

Question 5 (d)

The wording of the specification suggests the stabilisation of sandy coasts includes not only dune successional development, but also salt marsh development in estuarine areas. Nevertheless the vast majority of candidates chose to write in detail about dune development and mangroves and offered excellent explanations of how these stabilised the coastline. The very best responses offered the keychain explanations about succession, noting the development of the humus layer of soil as a result of plant decay. Weaker candidates tended to confuse the idea of coastline stability, or stated that vegetation held sand together, or were not clear about successional development stages.

(d) Explain how vegetation helps stabilise sandy coastlines.

(6)

A pioneer species is one which is first to colonise in bare ground. This pioneer species then causes more species to grow, as it ~~causes it~~ then becomes habitabal. Theses species allow the soil to become rich of nutrients, therefore allowing other species to also be able to grow. An example of a pioneer species is marram grass on sand dunes.

ResultsPlus
Examiner Comments

See below

ResultsPlus
Examiner Tip

This is a level 2 response, scoring 3 marks. There is some explanation of succession, but concentrated around just the one idea.

(d) Explain how vegetation helps stabilise sandy coastlines.

(6)

Firstly, embryo pioneer dunes help stabilise the sand dunes or land (sandy coastlines) in many ways.

For example, firstly the make the land more compact and still, as the roots of the plants hold the sediments together, this doesn't allow sediments to get eroded easily.

Secondly, the protect the coastline from soil erosion, e.g. they cover the surface with grass and leaves so that wind doesn't erode the soil.

Thirdly, they encourage further growth, as once the coastline is stable, they add dead organic matter to make the soil more compact, and encourage more deposition of sediments, as material (sand) can get stuck into grass rather than getting eroded.

ResultsPlus
Examiner Comments

This response is much stronger, describing two different geographical situations, with development of the ideas to show the impact on different sets of geographical processes (i.e. keychains). In this case it also shows how the breakdown of vegetation creates humus and soil that sustains more complex vegetation types.

ResultsPlus
Examiner Tip

Remember to write developed key-chains that show how different processes are linked within geographical situations.

Question 5 (e)

Most candidates had a clear grasp of different types of social and economic impacts, with the majority focusing on danger to life, infrastructure access and damage to tourism. Many were able to comment on both types, but relatively few candidates compared the actual risks. It was surprising to read many examples of Holderness and 'Sue Earls' farm - the danger here is that use of this classic GCSE case study led to superficial discussion and centres might be advised to find more contemporary and complex teaching resources.

By contrast, better responses recognised how threats to coastlines became risks, particularly when balancing the risk of doing something against doing nothing. There were good choices of case studies to illustrate this (e.g. Lyme Regis). Others took a broader view of the threats and widened their discussion to include coastal flooding and associated managed retreat in more low-lying landscapes, for example the social risks associated with refugees from the Maldives or Kiribati. As with 2e, the very best answers reached clear final judgement about the most serious type of risk (or threat).

People losing property and homes.

(e) Assess the social and economic risks of rapid coastal retreat. ← Holderness, North Norfolk, Happisburgh. could lose vital areas such as homes. (12)

Rapid coastal retreat has many impacts ~~that~~ that affect an area positively and negatively.

Social risks of rapid coastal retreat include the loss of property and land. This can affect people negatively, as they wouldn't have been able to afford moving out, as well as them being homeless after the loss of their house. Also, it can cause conflict between these land and property owners with ~~businesses~~ the local authorities, as ~~they~~ ~~could have a~~ the authorities could have enabled managed retreat on the area, due to its low economic value and importance. * such as in Holderness ~~Also, it~~ ~~However, these impacts occur~~ and Happisburgh ~~in Holderness~~

Economic risks that come with rapid coastal retreat come with the loss of towns located on the coast. This can drastically affect the local economy, as towns are a vital centre to job provision and the provision of important services to local people. Also, rapid coastal retreat has forced councils to invest in hard engineering techniques to protect ~~the~~ economically sensitive areas. This could have a detrimental effect to the local economy, as ~~millions~~ could

be spent on ~~the~~ just evening the defences, as well as maintaining it constantly to increase its longevity.

Overall, the economic risks of coastal retreat over ranks the social risks to coastal retreat, as the government tend to invest in ~~the~~ schemes of ICZM that would benefit areas important to the regional and even the national economy, such as locations such as Sandbanks in Dorset and Seaford, even though the social factors are quite substantial in their own right.

ResultsPlus
Examiner Comments

This is a strong response, with well-chosen examples that help to show the conflict between coastal stakeholders because of the economic and social risks. It also recognises the risks created by management, and above all compares all of these to help it genuinely assess. It scored 10 marks. The conflicts could be more defined for 12 marks.

ResultsPlus
Examiner Tip

Remember accurate and relevant geographic knowledge is a vital descriptor for level 3 responses. The best way is through location-specific knowledge.

Question 6 (a) (i)

Like 3ai, 6ai was generally answered well. Most candidates were able to identify two differences between the kite diagrams and use this to identify impacts of footpath management. The strongest candidates tended to write more clearly about the changes either to the sides of the footpath (e.g. more even coverage) or the more clearly defined path. Some candidates confused the diagrams and incorrectly used information from the kite diagram of the unmanaged footpath. Others got distracted by the additional gaps in the unmanaged section and this led to confused statements about the impact of one single pathway. As with 6aii, candidates need to remember to focus on the information in the resource, rather than speculating about the impacts of footpath management in general. Weaker candidates were unable to interpret this type of resource, or considered the general impacts of footpath management, rather than responding to the fieldwork resource.

6 (a) Study Figure 6 in the Resource Booklet.

A group of students collected data about footpath erosion at Studland Bay, a sand dune coastline in Southern England.

They measured vegetation cover across a transect on:

1. a managed footpath
2. an unmanaged footpath.

They presented their findings as two kite diagrams.

(i) Identify **two** impacts of footpath management.

(2)

1 One impact was that there was no vegetation between 2m and 8m.

2 There was a high percentage cover at the start and end.

ResultsPlus
Examiner Comments

Both points in this response are correct.

ResultsPlus
Examiner Tip

Remember to make clear point based on the information in the figure.

Question 6 (a) (ii)

As with 3aii, 6aii attracted a variety of responses and most candidates responded well to the fieldwork scenario - a key message from the June 2017 series. Most chose to write about the reduced risk to, or from walkers. The mark scheme reflects this variety, and reminds centres of the importance of making, and then developing, one suggestion that reflects the information given. A few candidates confused the impact of walking on coastal erosion, rather than the footpath itself.

(ii) Suggest **one** reason why footpath management is necessary in sandy coastal landscapes.

(2)

It means a greater number of species can grow their, it becomes ~~habitable~~ habitabal. There is a greater species richness.

ResultsPlus
Examiner Comments

This response was awarded 2 marks - there were two clear points about habitat and this was extended to write about species richness.

ResultsPlus
Examiner Tip

'Suggest one' questions require the main point to be developed in order to get the second mark. Write ideas, not just 'words'.

(ii) Suggest **one** reason why footpath management is necessary in sandy coastal landscapes.

(2)

Footpath erosion is more of a risk to the landscape because vegetation is used in that environment to stabilise the coast.

ResultsPlus
Examiner Comments

This response had one idea about stabilisation of the coast. The idea was not extended.

Question 6 (a) (iii)

As with 3aiii, 6aiii was poorly answered by many candidates - the vast majority of whom provided quantitative fieldwork techniques. Centres are advised to look at page 53 in the AS Geography specification, where a list of skills, both quantitative and qualitative are outlined.

Question 6 (a) (iv)

There were mixed responses to 6aiv, with many candidates not distinguishing between statistical methods and sampling strategies, nor able to identify any specific statistical methods. The scenario described in the question referred to relationship in order to encourage candidates to write about Spearman's Rank. However, some other tests (e.g. T-test and Mann-Whitney U) were also acceptable; it is possible that fieldwork data could have been set up to compare the two footpaths section.

The best responses, having identified a specific test, clearly understood how that test could be applied to the fieldwork scenario, as well as the importance of significance in deciding whether to accepting the hypothesis or not.

Although mathematical skills are still relatively new to GCSE and A-Level courses, centres need to help candidates by distinguishing between the role of Spearman's (Relationship), T-test (Comparison), and Chi^2 (categories of data).

(iv) The students also collected data at ten sites along the **unmanaged** footpath, measuring width at 30-metre intervals away from the car park, northwards.

They used this data to test the relationship between the width of the footpath and distance from the car park.

Explain how the use of a statistical method would help their investigation about footpath erosion.

(4)

The use of the ~~statistat~~ statistical method Spearman's Rank, would allow them to rank the ~~ten~~ ten sites and ~~their~~ the vegetation data. The value worked out at the end would show the reliability of their results.

ResultsPlus
Examiner Comments

One mark was awarded here for the identification of Spearman's Rank. The ideas about statistical testing had not been extended.

(iv) The students also collected data at ten sites along the **unmanaged** footpath, measuring width at 30-metre intervals away from the car park, northwards.

They used this data to test the relationship between the width of the footpath and distance from the car park.

Explain how the use of a statistical method would help their investigation about footpath erosion.

(4)

A student t test would allow the students to calculate weather changes in width of the footpath were a significant change or just down to chance. They would compare their calculated results to a significance level of 5% or (0.05) They must created a null hypothesis; no significant difference in path width and an alternate hypothesis and use their comparison to results to the significance level to decide weather to accept or reject their hypothesis.

ResultsPlus
Examiner Comments

This was a stronger response with an unusual start. But after identifying T-test, this response went on to write about testing for difference, significance and then using this information to decide whether to accept a null hypothesis or not. It scored 4 marks.

ResultsPlus
Examiner Tip

Although t-test was not the most obvious response to this question, it's possible to use it. Know your statistical tests!

Question 6 (b)

6b was answered relatively well. Many centres have noted the advice offered in the June 2017 series and many answers now began with a clear statement of a geographical question. The best outlined a hypothesis to be tested or a question to be answered. Many candidates were able to talk about different primary fieldwork methods to compare the size of beaches either size of groynes, or the effectiveness of coastal management, or the importance of particular factors in influencing coastal processes. Better answers distinguished between accuracy and reliability, as well as reaching a clear judgement about whether this affected their ability to answer the enquiry question. The very best also considered other factors, for example problems with sampling or whether wider geographical factors were taken into account by the fieldwork techniques - for example rock breakdown processes interfering with measurements of rock hardness. Weaker answers confused the terms accuracy and reliability, or did not offer plausible reasons for either, or got slightly fixated on the impact of poor weather conditions for collecting measurements.

(b) You have carried out **primary fieldwork** to investigate coastal landscapes and change.

Assess the accuracy and reliability of the **primary data** that you collected as part of your geographical investigation.

(9)

Geographical enquiry question:

How does the headland at Pwlldu bay, South Wales, affect the amount of deposition at the beach?

Our primary fieldwork took place near Swansea at the Gower peninsula at Pwlldu Bay. In order to compare the rates of deposition, we used the Cross Section Area (CSA) of two sites at either end of the beach, section A and section B. To do this, we used two ranging poles, a measuring tape and a clinometer. We used the ranging poles along with the clinometer to measure every time the gradient changed on the slope of the beach, from backshore to foreshore. This gave us the transsect of the slope, which we could then use to calculate the CSA of both sections, to allow us to see which section had the larger amount of deposition.

Our method could have been improved by keeping the people conducting the measurements the same to allow for a higher consistency in data and to keep the person's measurement strategies consistent. Furthermore, we needed to use two people of similar height to hold the ranging poles and use the clinometer, in order to make sure the angle of the gradient isn't influenced by the person being proportionally taller/smaller than the other.

ResultsPlus
Examiner Comments

This response scored 5 marks (level 2). There was evidence of sensible and relevant fieldwork being done which was clearly linked to the enquiry question. There was some critical consideration of its accuracy and reliability in the second paragraph. It was hard for the response to include judgement and build an argument because only one method was written about.

ResultsPlus
Examiner Tip

The best responses often write about 3 aspects of enquiry in these 9-mark questions, e.g. 3 piece of fieldwork, or 3 data presentation techniques.

(b) You have carried out **primary fieldwork** to investigate coastal landscapes and change.

Rocks hardness rock orientation
keups phase

Assess the accuracy and reliability of the **primary data** that you collected as part of your geographical investigation.

(9)

Geographical enquiry question:

Is geology the most important factor affecting North Antrim Coast.

We collected data for 13 different locations across North Antrim Coast which I believe was a ~~good~~ large sample size to obtain a good representation of the whole coast hence increasing the reliability of our results. One of our methods was keups phase which was used to identify whether the waves are destructive or constructive. Based on our hypothesis, the waves should all be the same type to ensure geology is the most important factor. Our results ~~suggested~~ supported our hypothesis because most of the waves along the coastline were constructive. There were some locations that affected our reliability because it had rocks/boulders that disrupted wave patterns.☆

We used Moh's index to measure the rock hardness of sediments along the coast line. At each ~~coastal~~ location we chose 5 rock samples which increased the reliability of our results. However when testing each sample there was not a

consistent amount of pressure/force exerted onto the rock each time. In addition, we scratched the surface of the rock which may have been weakened by weathering or erosion hence giving us inaccurate data.

Finally, to work out the rock orientation/angle of the strata we used a Clinometre app. This was the least accurate and reliable method as it provide false results. ~~For~~ At White Rocks it was clear to see that the cliffs was facing landward however our data suggested it was ~~point~~ seaward.

☆ In addition, the time of day a season can also affect tides which could have reduced the accuracy of our results.

Overall, ~~our~~ most accurate and reliable primary data was obtained from Kemps phase. **(Total for Question 6 = 18 marks)**

As we used the same conditions at each location. however, our least reliable data was when we worked out rock orientation because the Clinometre app was hard to operate.

ResultsPlus
Examiner Comments

This was a really strong response that scored full marks. There were 3 clear methods, and thought had been given to the strength of the accuracy and reliability. Crucially this had been considered in the context of the geographical situation. This was all helped by a strong and focused enquiry question.

ResultsPlus
Examiner Tip

Ask yourself the question, 'Why is your fieldwork inaccurate'? Go further than just saying 'user error' - did it help answer your enquiry question?

Question 7

Both questions 4 and 7 posed very different challenges to the June 2017 paper, concentrating on the interrelationships between two physical sets of processes in the formation of distinctive landscapes. Many candidates had learnt to try and make clear judgements about whether tectonics was more important than marine processes. Weaker answers tended to just use evidence from the booklet to show how landforms were the result of tectonics, and which were formed more by marine processes.

Better responses were guided by a broader range of evidence to present a case for either marine or tectonic processes, particularly noting the rate of change, or using their own knowledge to explain the factors in the resource booklet or suggest others. Integration of other factors (e.g. subaerial weathering and eustatic/isostatic change) helped to build arguments, as well as more sophisticated understanding of the slightly different roles of geology and lithology, particularly when influenced by dip and age. The very best responses focused on the idea of distinctiveness (what makes them distinctive, of which the most convincing was that 'distinctive' might mean local, so tectonics was less significant, although there are many ways to argue this). These answers also tended to structure their responses to include lots of mini-conclusions that directly addressed the question from both angles and noting the tension and interaction of the two in processes such as mass movement.

7 Study Figures 7a, 7b, 7c and 7d in the Resource Booklet.

Evaluate the importance of tectonic and marine processes in creating distinctive coastal landscapes in New Zealand.

(16)

It is important that the ~~processes of~~ marine processes are occuring especially in places such as Turakirae Head this is because ~~t~~ old rocks and fossils are being exposed this is extremely good for geologists who need to study the rock form and will make the job easier for them. Also the ~~tectoni~~ tectonic processes on Turakirae Head have created an isostatic change to the coastline which is very successive, in 1855 the beach rose by 2.5 metres. For an area close to very strong prevailing winds it dramatically would help reduce the areas risk of flooding and the mass movement from marine processes has transported large boulders which could help protect the coastline as a natural sea defence.

Due to natural sea level rise and a eustatic change Cook Strait was formed naturally, this distinctive coastline helps channel powerfull winds and tides ~~bet~~ between the parralel north and South islands,

this can be important as because the powerful tidal flow has found somewhere to channel through it will not erode the face of the Islands coastlines. It does bring a negative to Cook Strait though and erodes the cliffs on average at 1-2 metres per year this is because the fetch of the wave is so long reaching 2,000 Km the height ~~can go~~ can frequently reach 5m. It is many the steep cliffs on Cook Strait which face the problem of erosion. The distinctive coastline lays on the Australian and Pacific plate which can be a conservative plate boundary creating the succesful earthquakes at Turakirae head but also can push into each other becoming a destructive plate boundary and create uplift of land by 7mm per year.

The prevailing winds are so powerful and transport sediment that new land would be deposited on the beaches from the different constructive and destructive waves but also taken away from the coastline as the wave height being 5m would take away the loose sediment

ResultsPlus
Examiner Comments

This response contained geographical knowledge that was relevant and logically linked to the question. However it is mainly descriptive - looking at marine processes and tectonic processes, without building an argument for which is stronger. It also lacks a conclusion. This makes it a weak level 3 response (9 marks).

7 Study Figures 7a, 7b, 7c and 7d in the Resource Booklet.

Evaluate the importance of tectonic and marine processes in creating distinctive coastal landscapes in New Zealand.

(16)

Tectonic, marine and subaerial processes are factors which affect coastal landscapes. In this essay I will discuss the importance of these factors in affecting New Zealand's coastal landscape

In the Punakaiki Rocks, tectonic processes ~~are seen as~~ can be identified as being an important factor. This is because they have resulted in less jointed limestone which result in the formation of stacks The fact that limestone has become less jointed implies that ~~they~~ it has, too, become more resistant. Therefore, the coastline is less vulnerable to erosion. Thus, New Zealand's coastline becomes more distinctive. Additionally, tectonics have had a significant effect on Turakirae Head raised beach and fossil cliff. Earthquakes a ~~for~~ type of tectonic hazard, has caused an uplift of the beach level. This is evident in the fact ~~it has once~~ the beach level was as low as 2.5 metres in 1855 while in figure 7d, the photo and 7b and diagram of the area suggests a steep relief. Steeper slopes could make the area more vulnerable to mass movement such as soil creep. This Therefore, tectonic processes can be established as an important factor in ~~coastal landscapes~~ affecting New Zealand's landscape.

Other factors include erosional processes and subaerial processes. An example of a subaerial processes is mass movement. Mass movement has affected Turakirae Head raised beach and fossil cliff in the way that they have formed ridges of large boulders. Though this is a subaerial process, however, it is worsened by tectonic processes which make areas more vulnerable to mass movement. Erosional processes have eroded cliffs on average at around 1-2 metres/year. This has occured at Cook Strait. The eroded cliff could suggest erosion too is an important factor affecting New Zealand's coastline. However, it can be argued to not be as important as marine precesses at Cook Strait.

Marine processes have had a significant impact on New Zealand's coastline. This can be identified at Cook Strait The steep cliffs are battered by the Roaring Forties with a fetch of over 2,000 km (figure 7d). This has caused wave heights of over 5m to occur frequently and tidal flows approximately every 6-8 hours (figure 7d). This may result in large outbursts of water, which may result in fluvial erosion processes. Additionally, hydraulic action caused by pressure building up due to air and water being trapped in cracks of rock, could also affect the shape of the coastline, making it

more distinctive. Therefore, marine processes have a very big impact on the New Zealand's coastline as it is almost the source of a multiplier effect as it results in erosional process and hydraulic action.

In conclusion, though tectonic and marine processes aren't the only factors affecting the distinctiveness of New Zealand's coastline, they can be seen as the most important.

ResultsPlus
Examiner Comments

This was a very succinct and well-argued response. Lots of mini-conclusions at the end of paragraphs showed the candidate knew to evaluate the question and the conclusion at the end easily drew the main points together. By bringing in lots of other factors, they could easily address 'the importance' and show a flip-side to their argument.

ResultsPlus
Examiner Tip

Don't be afraid to challenge the question. Having written about tectonics and marine processes, are there other factors, either more or less important?

Paper Summary

Based on their performance on this paper, candidates are offered the following advice:

- Candidates should concentrate on 'explain' and 'assess' questions
- Candidates should concentrate on their fieldwork experience
- Candidates should carefully study the geographical enquiry question
- Candidates should concentrate on their use of comparative language
- Coastal landscapes and associated fieldwork scenarios are of prime importance

Grade Boundaries

Grade boundaries for this, and all other papers, can be found on the website on this link:

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