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91426



914260



NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

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SUPERVISOR'S USE ONLY

Level 3 Geography, 2018

91426 Demonstrate understanding of how interacting natural processes shape a New Zealand geographic environment

9.30 a.m. Friday 23 November 2018
Credits: Four

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of how interacting natural processes shape a New Zealand geographic environment.	Demonstrate in-depth understanding of how interacting natural processes shape a New Zealand geographic environment.	Demonstrate comprehensive understanding of how interacting natural processes shape a New Zealand geographic environment.

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should attempt the question in this booklet.

If you need more room for any answer, use the extra space provided at the back of this booklet.

Check that this booklet has pages 2–10 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

Achievement

TOTAL

4

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INSTRUCTIONS

Answer the question below. Your answer must relate to a **New Zealand geographic environment** that you have studied, and the key **interacting natural processes** that shape it.

Use page 3 to identify a **New Zealand geographic environment** you have studied, and two **interacting natural processes** that shape it, and to plan your response.

Integrate comprehensive supporting case study evidence into your written response to part (b). This may include diagram(s) and/or map(s), and you should also refer, where relevant, to your response to part (a).

QUESTION

- (a) Draw a diagram(s) and/or map(s) to explain how two named natural processes interact in your chosen New Zealand geographic environment (see page 4).
- (b) Comprehensively analyse how interacting natural processes create spatial variations within your chosen New Zealand geographic environment (see page 5).

New Zealand geographic environment: Muriwai Coastal Environment ✓

Interacting natural processes that shape this environment:

Natural process (1): Geological ✓

Natural process (2): Climatological, wave & biogeographical ✓

PLANNING (OPTIONAL)

Intertidal zone

- wave processes
 - ↳ wave pounding - abrasion & erosion
 - ↳ wetting & drying - weakens & erodes

Spray Zone

- climatological
 - ↳ exfoliation - disintegrates
 - ↳ salt crystallisation - weathers & disintegrates

Subaerial

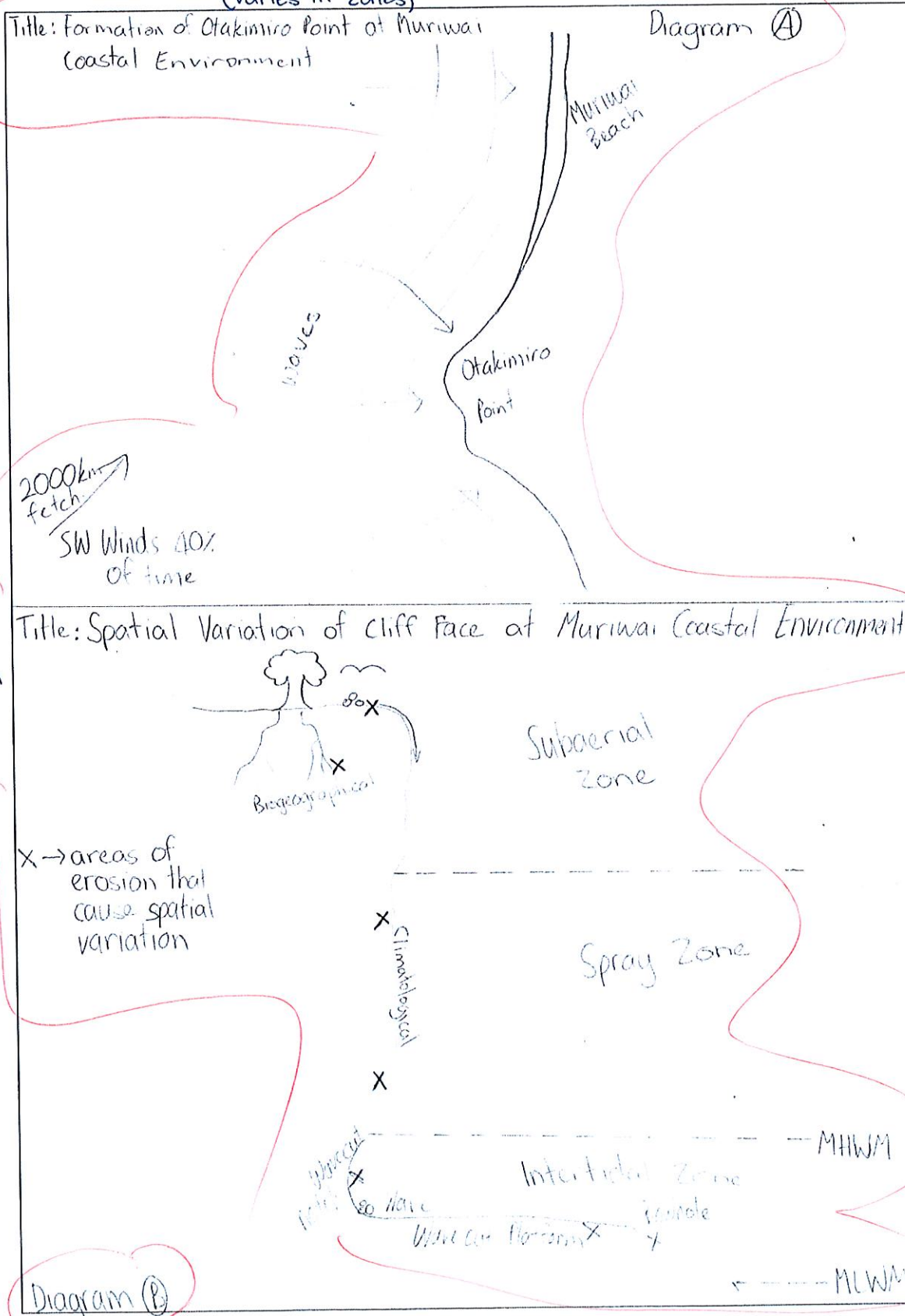
- ~~tz~~ - biogeographical
 - ↳ tree roots - pressure & stress
 - ↳ animals, burrowing & Guano - breaks down & exposes to weathering

- (a) Draw a diagram(s) and/or map(s) to explain how two natural processes interact in your chosen New Zealand geographic environment.

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Natural process (1): Geological

Natural process (2): Climatological / Wave / Biogeographical
(Varies in zones)



- (b) Comprehensively analyse how interacting natural processes create spatial variations within your chosen New Zealand geographic environment.

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Begin your written answer here, integrating comprehensive supporting case study evidence about your geographic environment and the interacting natural processes that shape it.

Refer to any diagram(s) and/or map(s) included within your written answer, as well as those in part (a) if they are relevant.

The Muriwai Coastal Environment is located in the North Island of New Zealand, approximately 35km West of Auckland CBD. This coastal environment ~~has~~ shows spatial variation due to the interaction of natural processes at the headland, Otakamiro Point. This headland was formed by wave refraction, as when the waves approached the shore, friction slowed them down in the shallow waters causing the waves to bend & refocus energy onto the headland (Diagram A). As the headland is then a high energy environment, coastal erosion dominates. Hence why Geological processes interact with Climatological, Wave & Biogeographical processes to erode the cliff face at different rates & scales.

The cliff face at Otakimiro Point is split into 3 areas/zones. Each zone has a different natural process which interacts with geological processes to erode the cliff, causing variation. The first and lowest zone is the intertidal zone, located between the Mean High Water Mark (MHW) & Mean Low Water Mark (MLW)*. Geological processes interact w/ wave processes in this zone. As waves attack the cliff base, it puts pressure onto the pre-existing faults & joints caused by geological processes. This weakens the rock & causes

*as shown in diagram B

it to break & forms ~~things~~ ^{features} like the blowhole in this environment. There is also wave pounding in which the waves causes features like the wave-cut platform & wave-cut notch as the waves cause abrasion & erosion. Wetting & drying is another ^{wave} process that causes spatial variation in the intertidal zone. At high-tide the rocks absorb ^{moisture} ~~water~~ & contract from cold, whereas in low-tide the water is released & the rock expands from warmth. This continuous process of expansion & contraction cause the rock to weaken & erode. It is these processes & the interaction of geological & wave processes that cause spatial variation in the intertidal zone. As these processes interact to cause a large scale of erosion, the cliff erodes at a faster rate than in other zones. //

The next zone is the spray zone, which is located just above the MHW. As it is above the normal wave height, it is not as impacted by wave processes. Instead it is more impacted by climatological processes, which interacts with the ^{processes} ~~ways~~ geological processes. Salt crystallisation is one of the ~~ways~~ ^{processes} which erodes the cliff. This occurs from sea spray getting in the cracks & crevices of the rock, which, when the water evaporates, causes salt crystals to form. These salt crystals cause the rocks to weather & disintegrate away. Exfoliation of the cliff face also occurs in this zone. During the day the sun heats up the rock & causes it to expand, while during the night the outer layers cool down & contract. Over the course of time the outer layers become weaker (from expanding & contracting a lot) //

and disintegrate away. Exfoliation occurs in rectangular blocks due to the pre-existing faults & joints from geological processes. Thus showing how climatological & geological processes interact in the spray zone to cause cliff erosion. These two processes don't interact on as big a scale as in the intertidal zone, so erosion occurs at a medium rate, causing spatial variation on cliff (intertidal zone more eroded than spray zone).
shown in diagram B

The last zone is the inter-subaerial zone, located at the very top of the cliff (refer to diagram B). This zone is far above sea level so is not affected by wave processes. It is instead affected by biogeographical processes, which also interacts with geological processes. Animals contribute to these biogeographical processes as the Muriwai gannet colony live on the headland. When animals are burrowing, they move bits of sediment, which in turn exposes more rock to weathering, so it erodes quicker. There is also the impact of guano from the gannets. As their waste is acidic, it causes the rocks to break down at a faster rate. Sediment is then transported down the cliff in the run off from rain. Another aspect of biogeographical processes is in the tree roots at top of cliff. When the roots grow, they grow into the pre-existing faults & joints that occur from geological processes. This puts stress & pressure onto the rocks and causes them to ~~break down~~ ^{weaken} & erode. And that is how biogeographical & geological processes interact in the subaerial zone to erode the cliff and overall cause spatial variation. This is due to the processes interacting

on a small scale, so the environment in the sub-aerial zone has ~~only~~ a slow rate of erosion, causing it to break down ~~in~~ over much longer time than the other zones. ✓

Overall, Muriwai ^{coastal environment} shows spatial variation on the head cliff face at the headland. This is because the 3 zones of the cliff have a different processes which interacts with geological processes, and these interactions occur on different scales. Thus there is a different rate of erosion in each zone, causing there to be spatial variation at Otakimiro Point in Muriwai. ✓

[*(biogeographical, climatological & wave)] ✓

A4

Achievement Exemplar 2018

Subject	Geography	Standard	91426	Total score	4
Q	Grade score	Annotation			
	A4	<p>Diagram is labelled with limited annotation, so it doesn't meet the criteria of explaining the interaction of the processes; however, this is covered in the written response.</p> <p>There is some supporting case study evidence, but it is limited to names of locations within the chosen geographical environment.</p> <p>There is some description of interactions and some analysis of spatial variation, but this is not provided in detail.</p>			