Please check the examination details below before entering your candidate information

Candidate surname	Other names

Pearson Edexcel Level 3 GCE

Centre Number | Candidate Number

Wednesday 20 May 2020

Afternoon (Time: 2 hours 15 minutes) | Paper Reference **9GE0/01**

Geography

Advanced
Paper 1

You must have:
Resource Booklet (enclosed)
Ruler, calculator

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions in Section **A** and Section **C**.
- Answer **either** Question 2 **or** Question 3 in Section **B**.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- Calculators may be used.
- Any **calculations** must show **all** stages of **working out** and a **clear answer**.

Information

- The total mark for this paper is 105.
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Check your answers if you have time at the end.

Turn over ▶

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SECTION A: TECTONIC PROCESSES AND HAZARDS

Answer ALL questions in this section. Write your answers in the spaces provided.

You must use the Resource Booklet provided.

1 Study Figure 1 below.

This data in Figure 1 was collected to investigate whether there was a significant relationship between the percentage of silica and the percentage of volatile gases in lava samples, found at 12 contrasting volcanic locations.

Lava samples from 12 contrasting volcanic locations (n=12)	% of silica in the lava	Rank	% of volatile gases*	Rank	d	d^2
1	50	9	1.9	11	–2	4
2	70	3	5.2	3	0	0
3	58	8	3.7	7	1	1
4	73	1	6.6	1	0	0
5	63	6	4.0	6	0	0
6	62	7	3.3	8	–1	1
7	45	12	3.0	9	3	9
8	71	2	4.1	5	–3	9
9	49	10	2.5	10	0	0
10	69	4	5.3	2	2	4
11	48	11	1.2	12	–1	1
12	68	5	4.5	4	1	1
					$\Sigma d^2 =$	

Figure 1

The % of silica and volatile gases in a selection of different lava samples found at 12 contrasting volcanic locations

*Volatile gases – gases emitted by volcanoes at high temperature such as water vapour, carbon dioxide and sulphur dioxide.

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(a) (i) Complete Figure 1 by calculating $\sum d^2$.

(1)

(ii) The formula for Spearman's rank correlation coefficient value r_s is given below; in this data set n is equal to 12.

$$r_s = 1 - \frac{6\sum d^2}{n^3 - n}$$

Calculate the value of r_s to two decimal places for the data given.

You must show your working.

(2)

r_s = ...

(iii) The tables below show the two hypotheses that are being tested and the critical values of Spearman's rank r_s value when n = 12.

Null hypothesis: There is no significant relationship between the % of silica and the % of volatile gases in these lava samples.
Alternative hypothesis: There is a significant relationship between the % of silica and the % of volatile gases in these lava samples.

Confidence level	0.10 (90% significance)	0.05 (95% significance)	0.01 (99% significance)
Critical value	0.50	0.59	0.78

Using the Spearman's rank correlation r_s value calculated in (a)(ii), state which hypothesis can be accepted.

(1)

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(b) Assess the relative importance of physical factors and processes in explaining the impacts of volcanic eruptions.

(12)

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(Total for Question 1 = 16 marks)

TOTAL FOR SECTION A = 16 MARKS

SECTION B: LANDSCAPE SYSTEMS, PROCESSES AND CHANGE

Answer ONE question in this section – either Question 2 OR Question 3.

Indicate which question you are answering by marking a cross in the box ☒. If you change your mind, put a line through the box ☒ and then indicate your new question with a cross ☒.

If you answer Question 2 put a cross in the box ☐ .

Glaciated Landscapes and Change

You must use the Resource Booklet provided.

2 Study Figure 2a in the Resource Booklet.

(a) Explain the role of Milankovitch cycles in causing variations in the relative global ice volume.

(6)

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Study Figure 2b in the Resource Booklet.

(b) Explain the role of mean annual air temperature in influencing the distribution of permafrost across Canada.

(6)

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(c) Explain how upland glacial landforms can be used to study former ice extent and movement.

(8)

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(d) Evaluate the view that the threats to glaciated landscapes can only be managed successfully on a global scale.

(20)

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(Total for Question 2 = 40 marks)

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Do not answer Question 3 if you have answered Question 2.

Indicate which question you are answering by marking a cross in the box ☒. If you change your mind, put a line through the box ☒ and then indicate your new question with a cross ☒.

If you answer Question 3 put a cross in the box ☐ .

Coastal Landscapes and Change

You must use the Resource Booklet provided.

3 Study Figure 3a in the Resource Booklet.

(a) Explain the role of isostatic processes in causing changes in relative sea level.

(6)

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Study Figure 3b in the Resource Booklet.

(b) Explain the role of sediment transport in the development of this coastal landscape.

(6)

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(c) Explain why sustainable management of coastlines may lead to local conflicts.

(8)

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(d) Evaluate the view that rates of coastal recession are largely controlled by geological factors.

(20)

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(Total for Question 3 = 40 marks)

TOTAL FOR SECTION B = 40 MARKS

SECTION C: PHYSICAL SYSTEMS AND SUSTAINABILITY

Answer ALL questions in this section. Write your answers in the spaces provided.

You must use the Resource Booklet provided.

4 Study Figure 4 in the Resource Booklet.

(a) Explain **one** impact of an El Niño event on the hydrological system.

(3)

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(b) Explain how the physical features of a drainage basin affect the shape of storm hydrographs.

You may draw a diagram to help your answer.

(6)

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(c) Explain why human actions often increase water insecurity.

(8)

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(d) Assess the importance of renewable energy in reducing the risks of further planetary warming.

(12)

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(e) Evaluate the view that changes to the carbon cycle pose more threats to people than changes to the water cycle.

(20)

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(Total for Question 4 = 49 marks)

TOTAL FOR SECTION C = 49 MARKS
TOTAL FOR PAPER = 105 MARKS

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Geography

Advanced

Paper 1

Resource Booklet

Do not return this Resource Booklet with the question paper.

Turn over

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SECTION B

The following resources relate to Question 2.

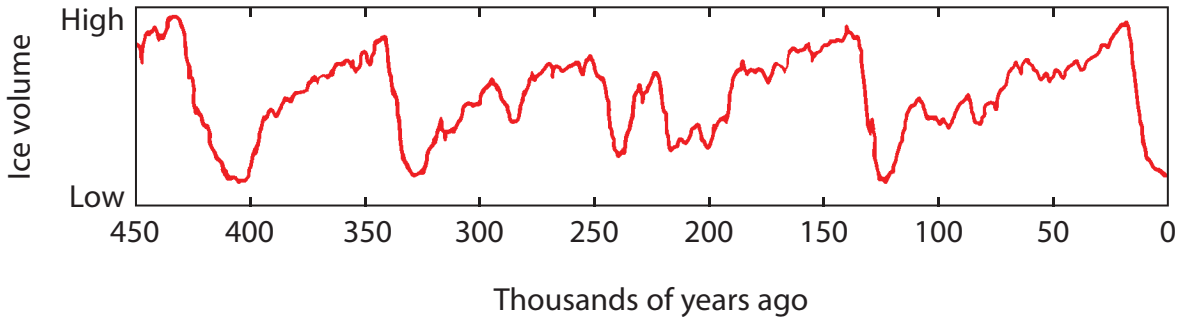

Figure 2a

Relative global ice volume over the last 450 000 years

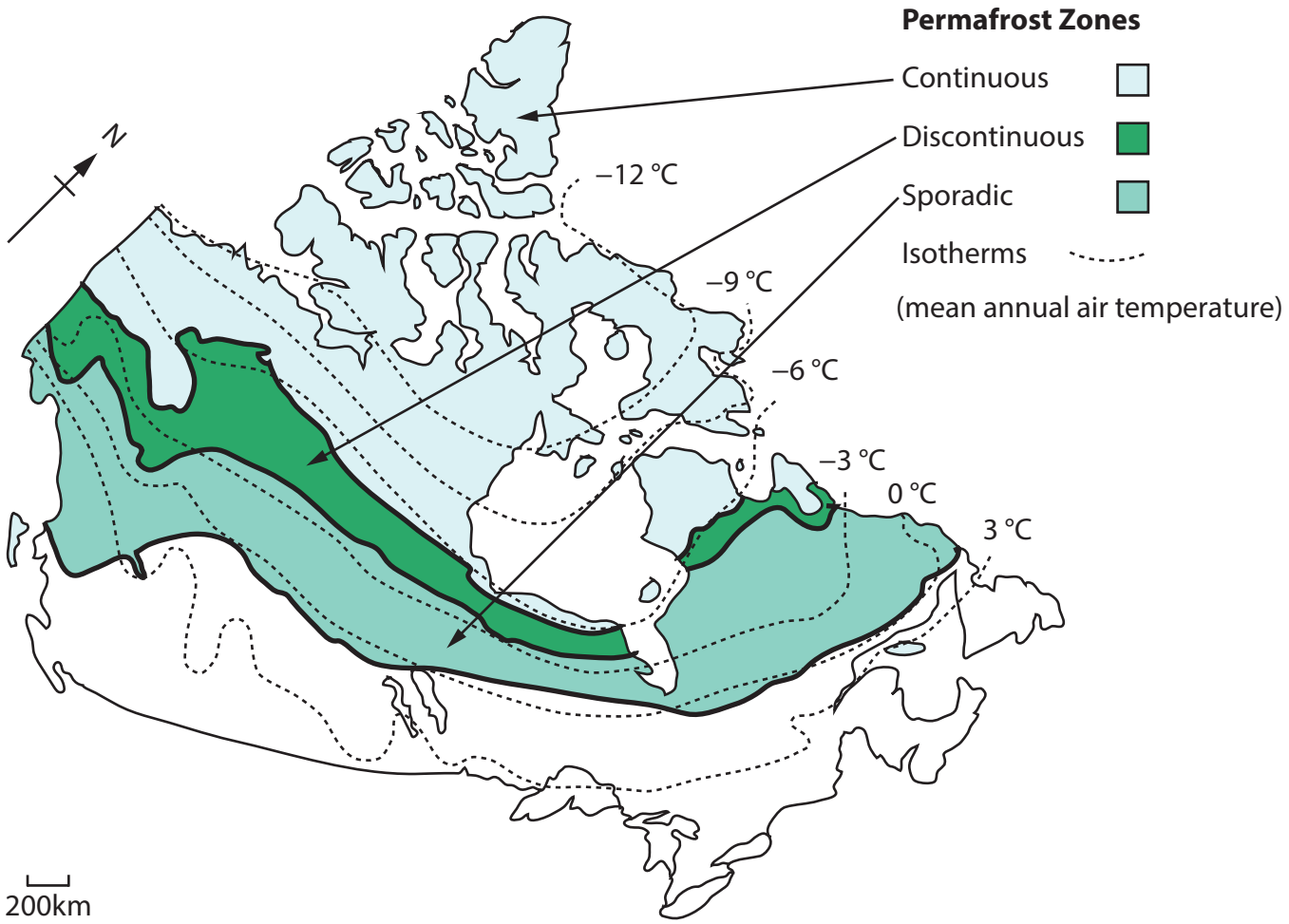

Figure 2b

The distribution of permafrost and mean annual air temperature across Canada

The following resources relate to Question 3.

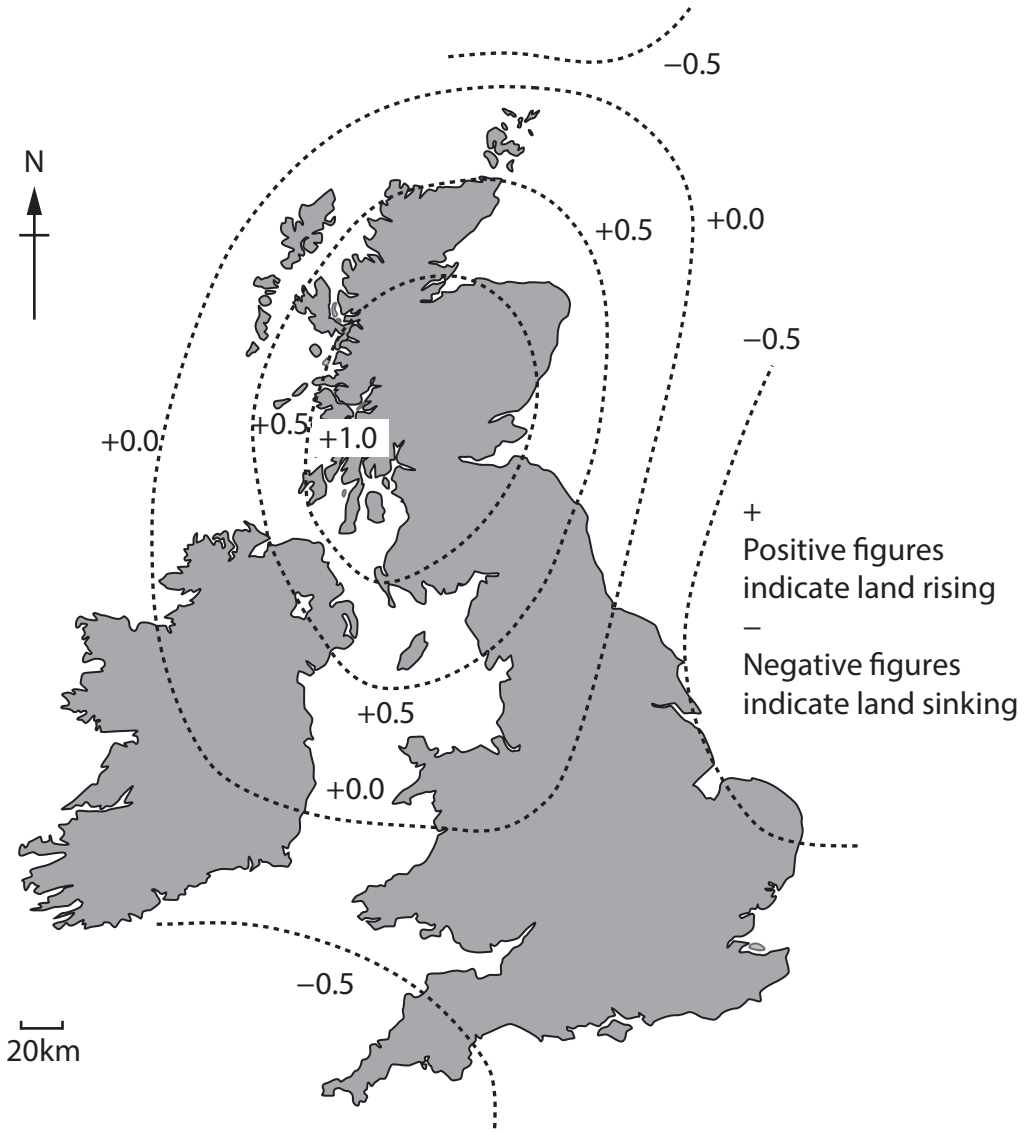

Figure 3a

Current rate of relative land and sea level change in the British Isles in mm per year

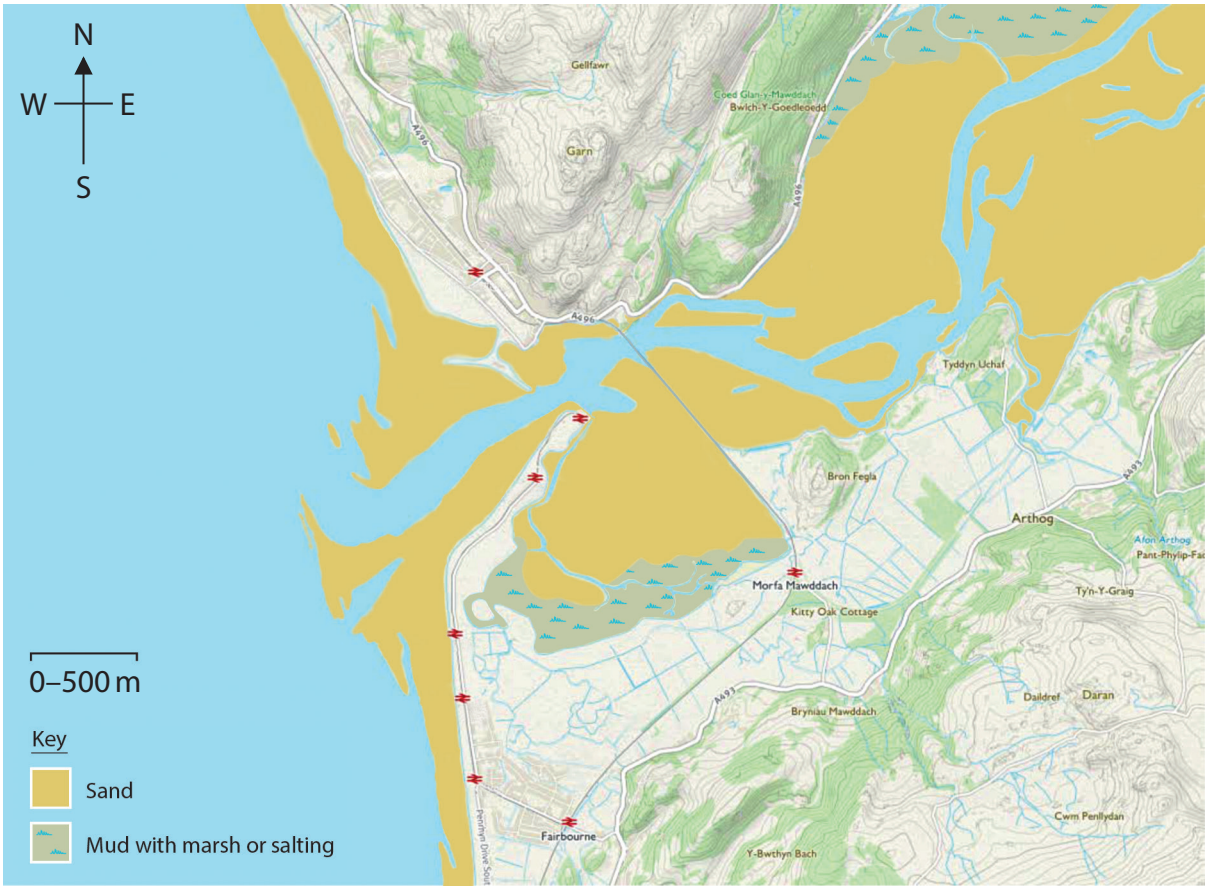

Figure 3b

A depositional landscape in North Wales

SECTION C

The following resource relates to Question 4.

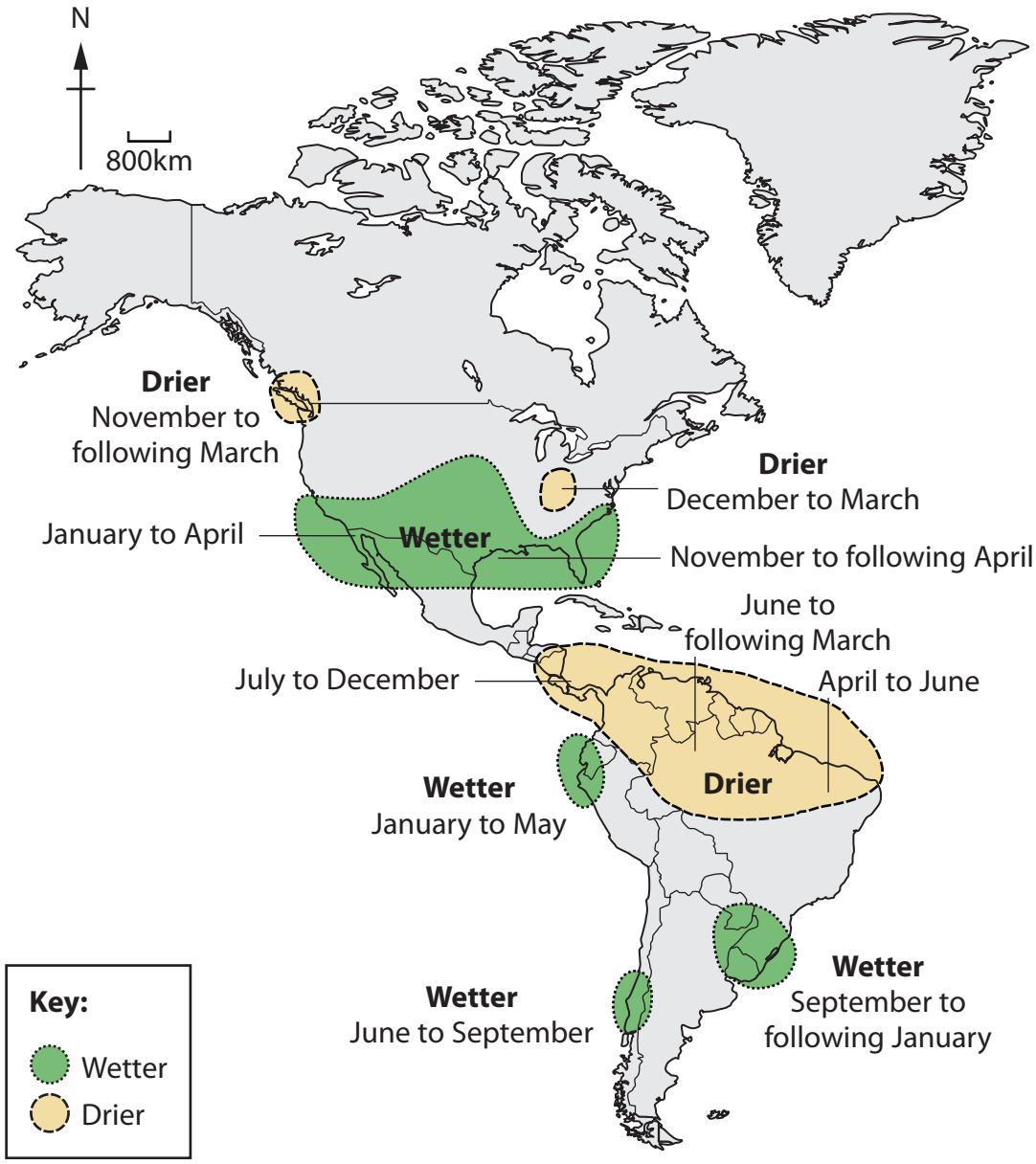

Figure 4

Changes to precipitation patterns during an El Niño event

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Pearson Education Ltd. gratefully acknowledges the following sources used in preparation of this paper:
Figure 1 Sourced from:
https://opentextbc.ca/geology/chapter/4-2-magma-composition-and-eruption-style/
Figure 2a Sourced from: http://www.antarcticglaciers.org/glaciers-and-climate/ice-cores/ice-core-basics/
Figure 3a Sourced from:
https://www.geosociety.org/gsatoday/archive/19/9/figure/i1052-5173-19-9-52-f01.htm