



**GCE AS/A LEVEL**

**2110U10-1**

**TUESDAY, 17 MAY 2022 – AFTERNOON**

**GEOGRAPHY – AS unit 1  
CHANGING LANDSCAPES**

**2 hours plus your additional time allowance**

**Surname**

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**First name(s)**

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**Centre Number**

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**Candidate Number**

**2**

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**ADDITIONAL MATERIALS**

**A calculator.**

**INSTRUCTIONS TO CANDIDATES**

**Use black ink, black ball-point pen or your usual method.**

**You may use a pencil for graphs and diagrams only.**

**Write your name, centre number and candidate number in the spaces on the previous page.**

**Write your answers in the spaces provided in this booklet.**

**In Section A, answer EITHER questions 1 and 2 OR questions 3 and 4.**

**Answer ALL questions in Section B.**

**If further space is required you should use the additional page(s) at the back of this booklet.  
The question number(s) should be clearly shown.**

**(Turn over)**

**INFORMATION FOR CANDIDATES**

**The number of marks is given in brackets [ ] at the end of each question or part-question; you are advised to divide your time accordingly.**

**THIS PAPER REQUIRES THAT YOU MAKE AS FULL USE AS POSSIBLE OF APPROPRIATE EXAMPLES AND REFERENCE TO DATA TO SUPPORT YOUR ANSWERS. SKETCH MAPS AND DIAGRAMS SHOULD BE INCLUDED WHERE RELEVANT.**

**A plain page is available near the back of the booklet for you to add any relevant sketch maps and diagrams you may wish to include. The question number(s) should be clearly shown.**

**(Turn over)**

## **SECTION A: CHANGING LANDSCAPES**

**Answer EITHER questions 1 and 2 OR questions 3 and 4 from your chosen landscape.**

**Make the fullest possible use of examples and data to support your answers.**

### **COASTAL LANDSCAPES**

**Answer questions 1 and 2 if this is your chosen landscape.**

**(Turn over)**

**1 (a) (i) Use FIGURES 1a and 1b opposite to compare the characteristics of the two beaches.**

**[5 marks]**

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**1 (a) (ii)      Suggest ONE reason why the beach in  
FIGURE 1a is backed by sand dunes.**

**[3 marks]**

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**1 (b) Assess the importance of constructive waves in the development of beach profiles. [8 marks]**

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**Additional space for Question 1(b) only:**

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- 2 (a) (i) Use FIGURE 2 opposite to describe the pattern of vertical crustal movement relative to sea level.**  
**[5 marks]**

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**2 (a) (ii) Suggest ONE reason for the variations seen in  
FIGURE 2. [3 marks]**

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**(Turn over)**

**2 (b) Examine the role of ONE mass movement process in the development of ONE OR MORE coastal landforms. [8 marks]**

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**Additional space for Question 2(b) only:**

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## GLACIATED LANDSCAPES

**Answer questions 3 and 4 if this is your chosen landscape.**

**3 (a) (i) Use FIGURES 3a and 3b opposite to compare the characteristics of the two cirques. [5 marks]**

[illegible]

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**3 (a) (ii) Suggest ONE reason for the difference in the characteristics of the backwall of the two cirques. [3 marks]**

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**3 (b)      Assess the importance of ice thickness as a factor affecting the rate of glacial erosion.**

**[8 marks]**

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**Additional space for Question 3(b) only:**

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**(Turn over)**

**4 (a) (i) Use FIGURE 4 opposite to describe the pattern of flow velocity. [5 marks]**

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**4 (a) (ii) Suggest ONE reason why the flow velocity varies. [3 marks]**

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**4 (b) Examine the role of ONE mass movement process in the development of ONE OR MORE periglacial landforms. [8 marks]**

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

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**Additional space for Question 4(b) only:**

[illegible]

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## SECTION B: TECTONIC HAZARDS

**Answer ALL questions.**

**Make the fullest possible use of examples and data to support your answers.**

**5 (a) (i) Use FIGURE 5a opposite to analyse the relative significance of the different causes of death.**

**[5 marks]**

This image shows a blank sheet of white paper with horizontal black ruling lines. The lines are evenly spaced and run across the width of the page, providing a template for writing or drawing. There are no margins, text, or other markings on the paper.

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**5 (a) (ii) Use FIGURES 5a and 5b opposite to examine the physical factors that may influence the number of deaths resulting from volcanic eruptions. [9 marks]**

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**Additional space for Question 5(a)(ii) only:**

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**5 (b) Briefly outline the characteristics of:**

**(i) explosive eruptions [4 marks]**

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**5 (b) (ii) effusive eruptions [4 marks]**

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**Study FIGURE 6a opposite.**

- 6 (a) (i) State the range of percentage of ports exposed to lahars. [1 mark]**

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- (ii) Calculate the mean percentage of main roads exposed to pyroclastic flows. Show your working. [2 marks]**

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**6 (b) Use the information in FIGURE 6a to suggest which hazard is the greatest threat to infrastructure. [5 marks]**

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- 6 (c) (i) Use FIGURE 6b opposite to calculate the percentage of Indonesia's volcanoes that are NOT monitored. Give your answer to ONE decimal place. Show your working. [3 marks]**

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**6 (c) (ii) Use FIGURE 6b to compare risk levels for volcanoes that are not monitored and those that are monitored monthly. [3 marks]**

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**6 (d) Use FIGURES 6a to 6d to examine HUMAN reasons why there may be variations in the severity of impacts associated with volcanic eruptions. [10 marks]**

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**Additional space for Question 6(d) only:**

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

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- 7 (a) Explain how the processes associated with earthquakes produce ONE OR MORE hazards. [10 marks]**

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**Additional space for Question 7(a) only:**

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**7 (b) Examine the success of ONE OR MORE long-term responses to the effects of earthquake hazards. [8 marks]**

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

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**Additional space for Question 7(b) only:**

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**END OF PAPER**

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| <b>Question<br/>number</b> | <b>ADDITIONAL PAGE, IF REQUIRED.<br/>WRITE THE QUESTION NUMBER(S) IN THE<br/>LEFT-HAND MARGIN.</b> |
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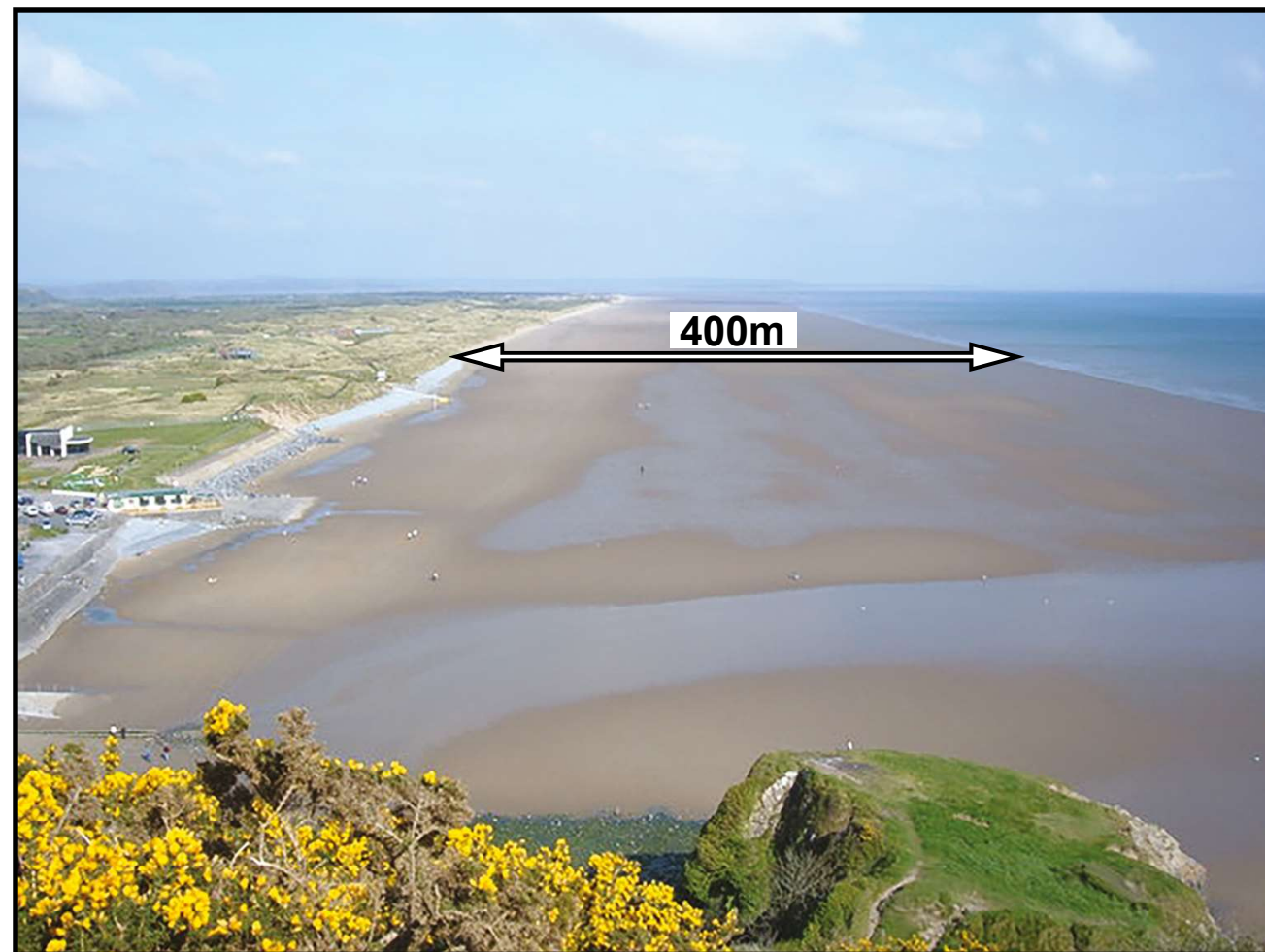






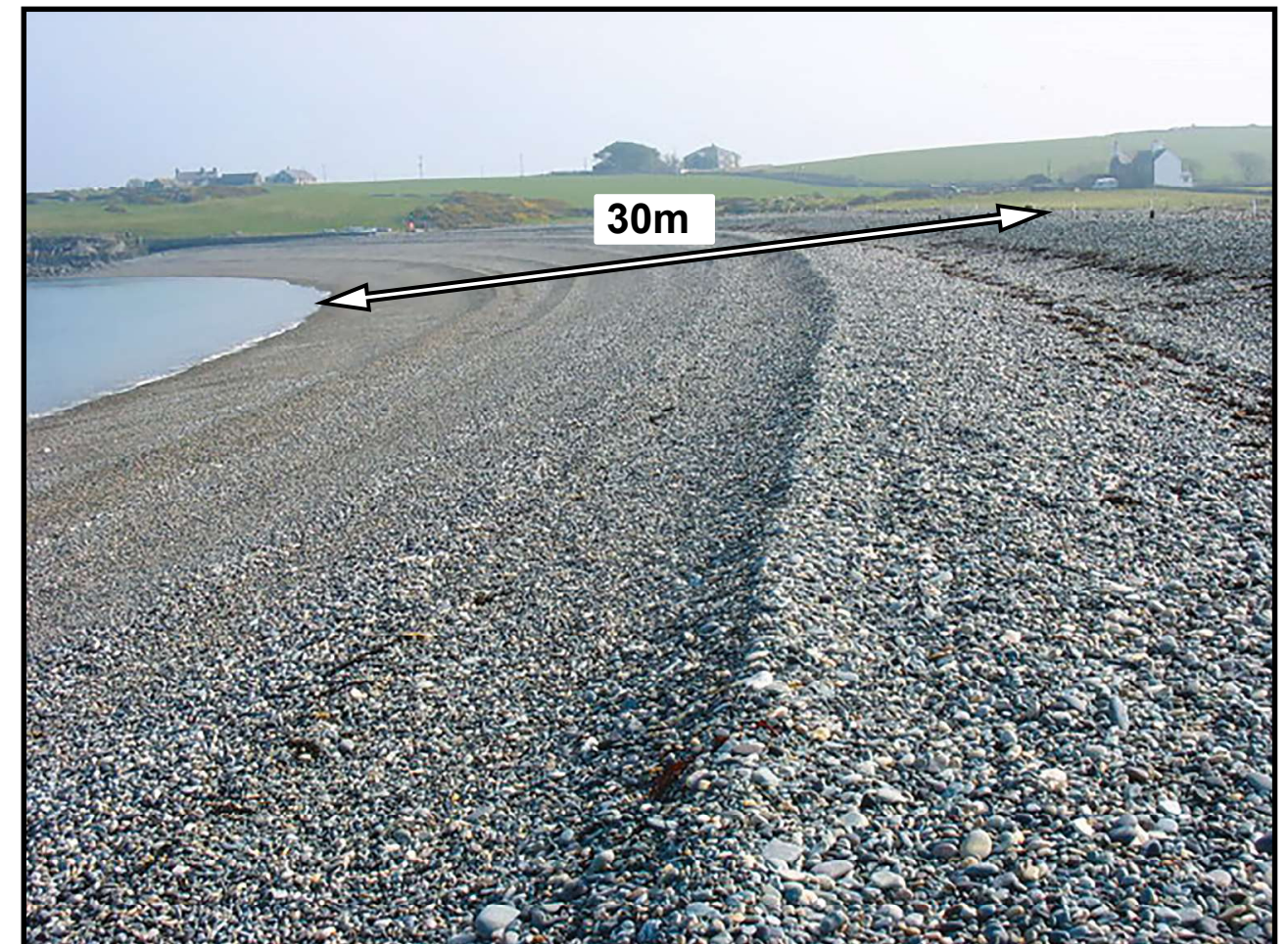
| For Examiner's use only            |              |              |
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| Question                           | Maximum Mark | Mark Awarded |
| Either<br>1 and 2<br>or<br>3 and 4 | 16           |              |
|                                    | 16           |              |
|                                    | 16           |              |
|                                    | 16           |              |
| 5                                  | 22           |              |
| 6                                  | 24           |              |
| 7                                  | 18           |              |
| Total                              | 96           |              |

**FIGURE 1a: Pendine Sands,  
Carmarthenshire, Wales**



Source: [www.coastradar.com](http://www.coastradar.com)

**FIGURE 1b: Esgair Gemlyn,  
Anglesey, Wales**



Source: [www.geograph.org.uk](http://www.geograph.org.uk)

**FIGURE 2: Isopleth map of vertical crustal movement relative to sea level in Scandinavia**

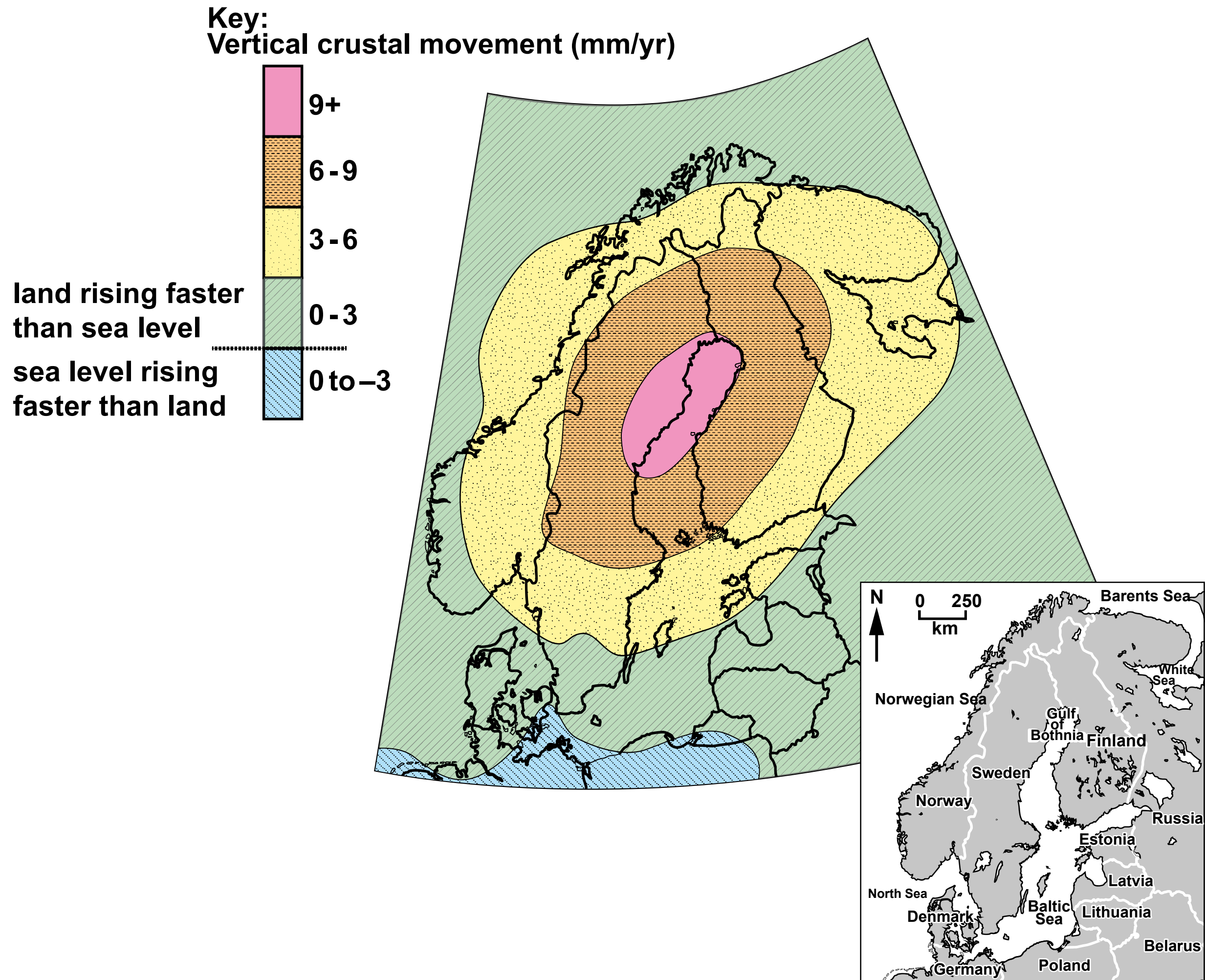
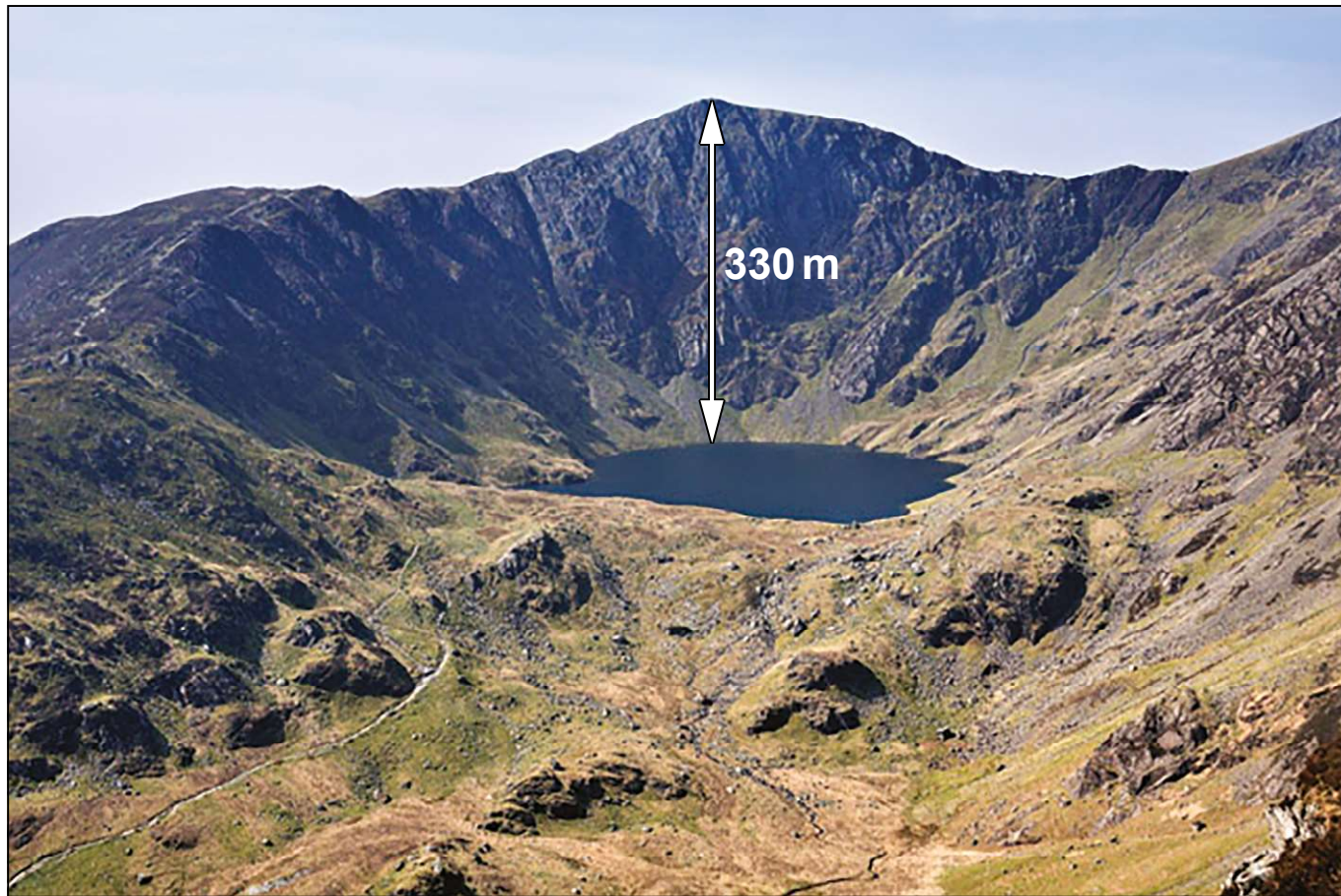


**FIGURE 3a: Cwm Cau, Snowdonia, Wales**



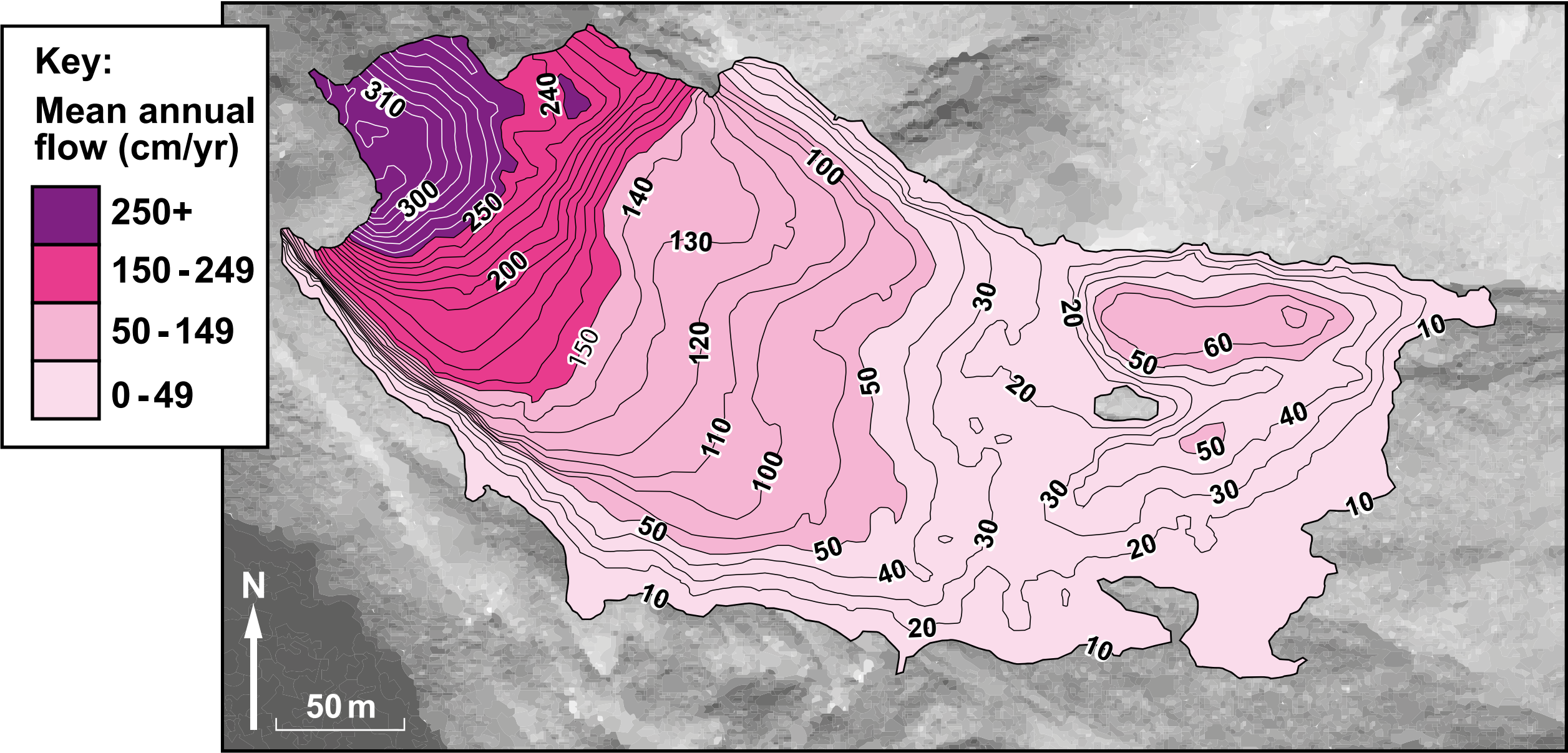
Source: [www.geologywales.co.uk](http://www.geologywales.co.uk)

**FIGURE 3b: Craig Rhiw-erch, Snowdonia, Wales**



Source: [www.geograph.org.uk](http://www.geograph.org.uk)

**FIGURE 4: Mean annual flow velocities of the Hinteres Langtalkar glacier, Austria**



Source: zobodat.at

**FIGURE 5a: GLOBAL DEATHS AS A RESULT OF  
SELECTED VOLCANIC HAZARDS, 1600-2010**

| <b>DEATHS</b>  | <b>VOLCANIC HAZARD</b>                   |
|----------------|------------------------------------------|
| <b>91 484</b>  | <b>Pyroclastic Flows</b>                 |
| <b>65 024</b>  | <b>Indirect (Starvation and disease)</b> |
| <b>55 277</b>  | <b>Waves (Tsunami)</b>                   |
| <b>37 451</b>  | <b>Lahars (Primary)</b>                  |
| <b>8126</b>    | <b>Tephra</b>                            |
| <b>6801</b>    | <b>Lahars (Secondary)</b>                |
| <b>5230</b>    | <b>Avalanches</b>                        |
| <b>2151</b>    | <b>Gas</b>                               |
| <b>1163</b>    | <b>Floods (Jökulhlaups)</b>              |
| <b>887</b>     | <b>Lava Flows</b>                        |
| <b>765</b>     | <b>Seismicity</b>                        |
| <b>142</b>     | <b>Lightning</b>                         |
| <b>274 501</b> |                                          |

Adapted from: <https://link.springer.com>

**FIGURE 5b: The global relationship between eruption size (VEI), number of deaths and distance from eruptions for selected volcanic hazards**

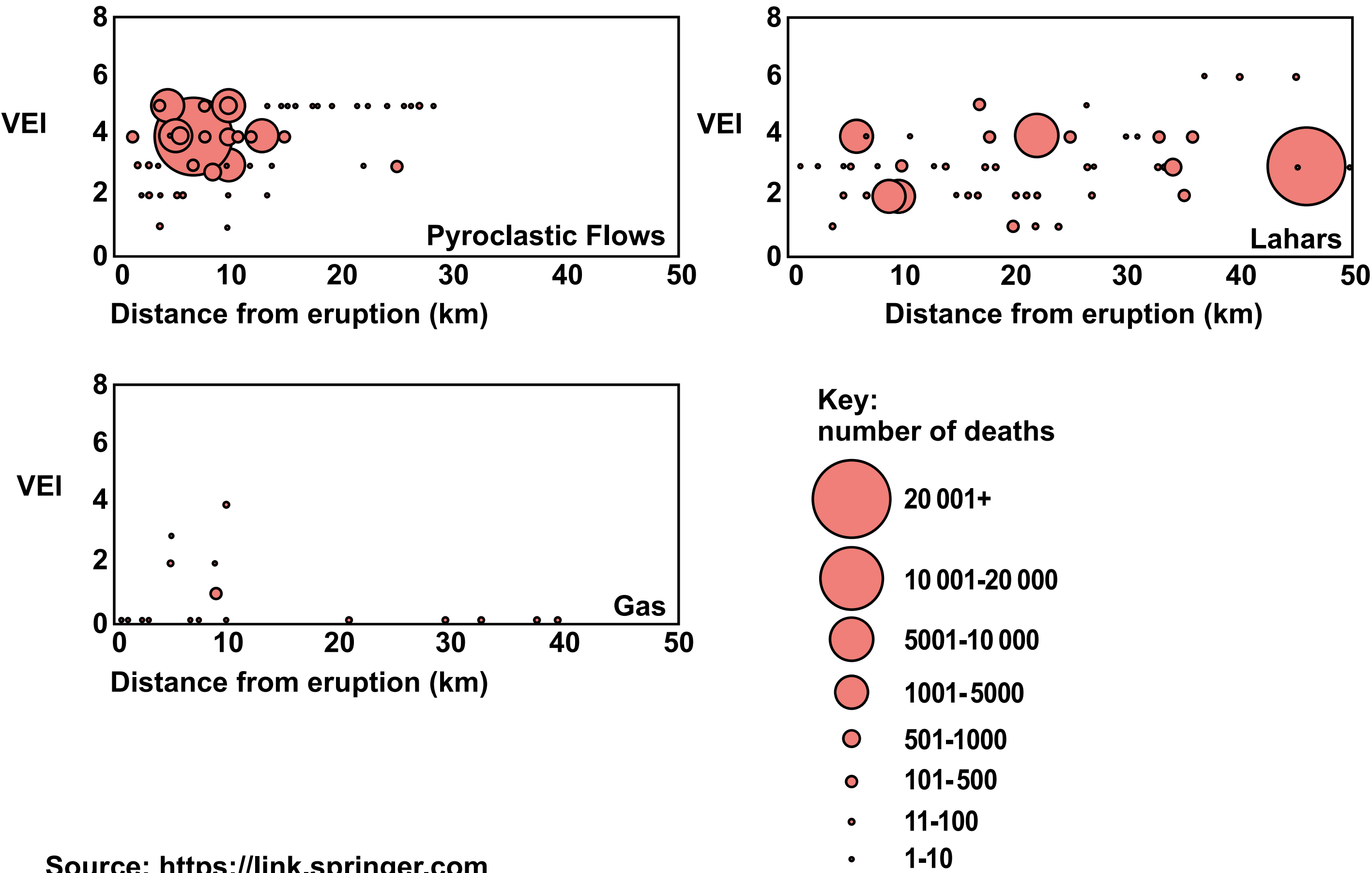


**FIGURE 6a: The extent of infrastructure exposure to lahars and pyroclastic flows in selected South East Asian countries**

|                                 | % cities<br>(20 000+)<br>exposed<br>to lahars | % cities<br>(20 000+)<br>exposed<br>to<br>pyroclastic<br>flows | % ports<br>exposed<br>to lahars | % ports<br>exposed<br>to<br>pyroclastic<br>flows | % main<br>roads<br>exposed<br>to lahars | % main<br>roads<br>exposed<br>to<br>pyroclastic<br>flows | % airports<br>exposed<br>to lahars | % airports<br>exposed<br>to<br>pyroclastic<br>flows |
|---------------------------------|-----------------------------------------------|----------------------------------------------------------------|---------------------------------|--------------------------------------------------|-----------------------------------------|----------------------------------------------------------|------------------------------------|-----------------------------------------------------|
| <b>Indonesia</b>                | <b>44</b>                                     | <b>32</b>                                                      | <b>8</b>                        | <b>7</b>                                         | <b>24</b>                               | <b>14</b>                                                | <b>12</b>                          | <b>7</b>                                            |
| <b>Papua<br/>New<br/>Guinea</b> | <b>38</b>                                     | <b>13</b>                                                      | <b>10</b>                       | <b>15</b>                                        | <b>12</b>                               | <b>0</b>                                                 | <b>6</b>                           | <b>6</b>                                            |
| <b>Philippines</b>              | <b>33</b>                                     | <b>20</b>                                                      | <b>4</b>                        | <b>9</b>                                         | <b>14</b>                               | <b>7</b>                                                 | <b>13</b>                          | <b>9</b>                                            |

Adapted from: <http://globalvolcanomodel.org>

**FIGURE 6b: Levels of monitoring and risk for the volcanoes of Indonesia**

**Number of  
volcanoes**

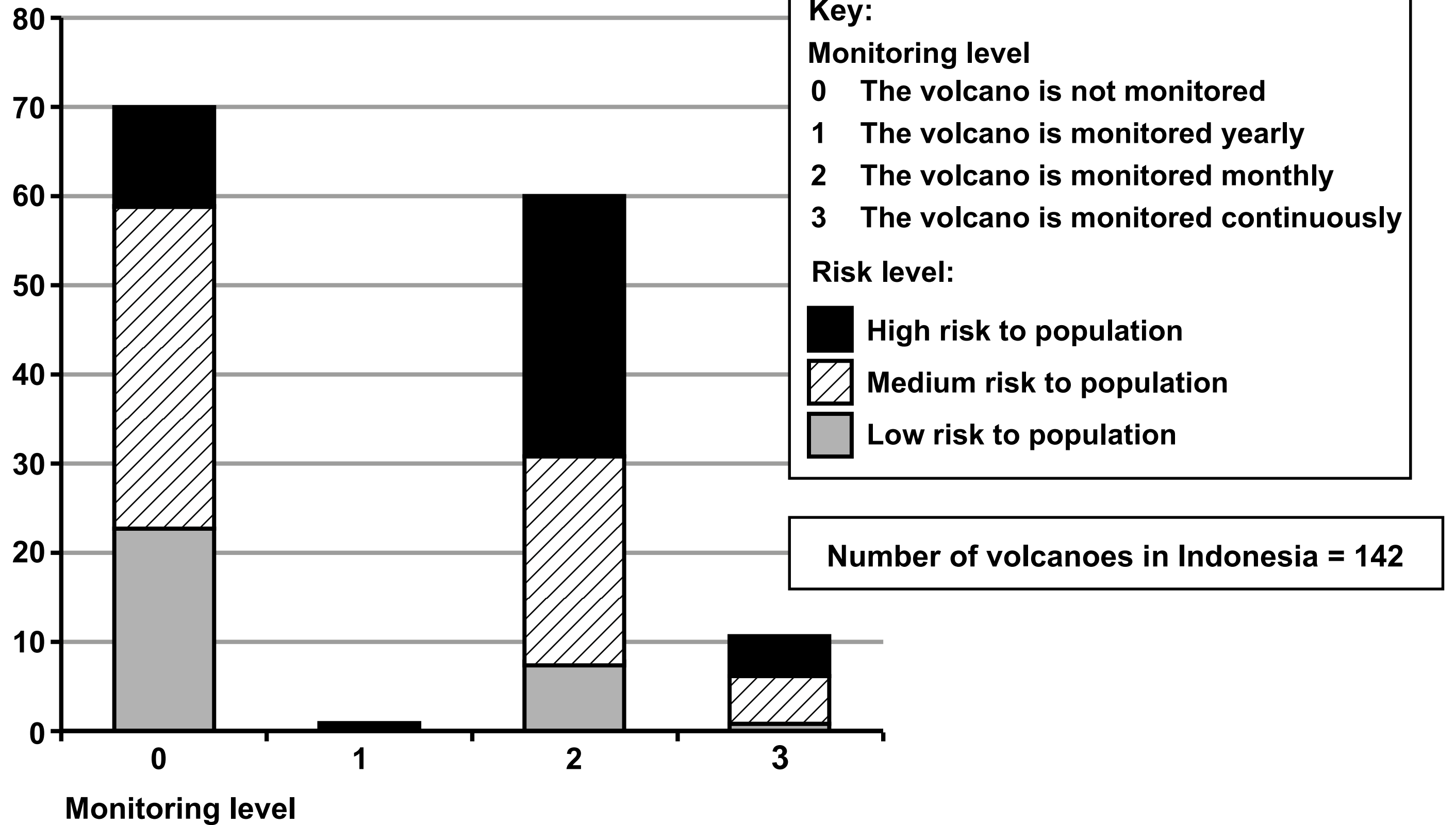
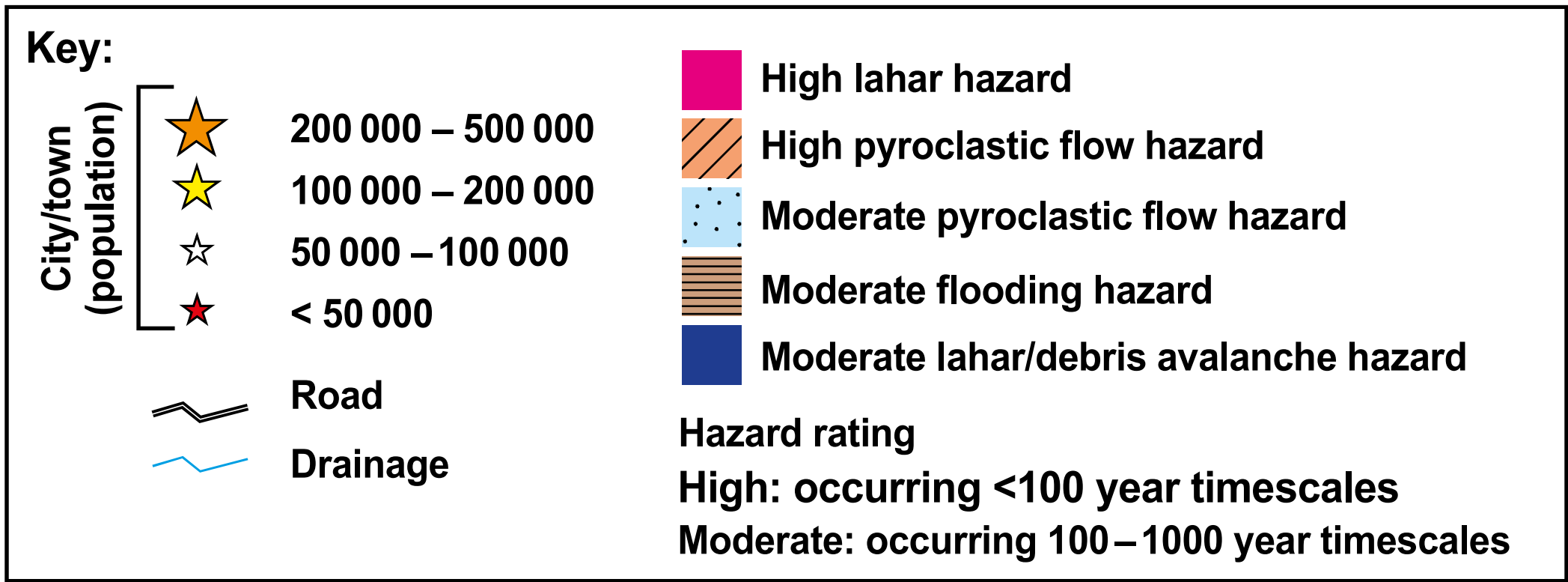
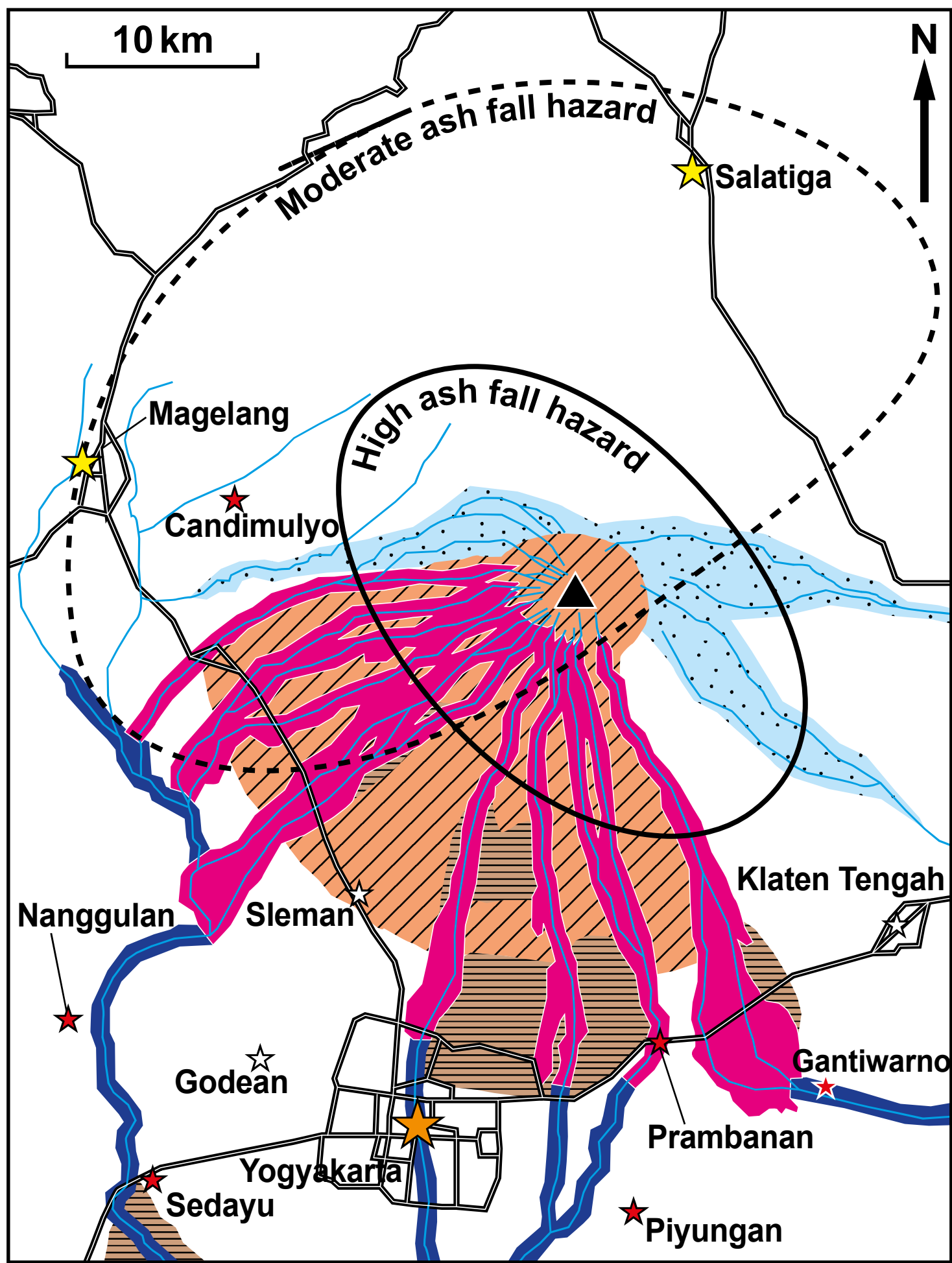


FIGURE 6c: Hazard map of the Mount Merapi volcano area, Indonesia



Source: <https://gunungmerapi.weebly.com>

**FIGURE 6d: Installing volcano monitoring equipment in Indonesia**



Source: <https://www.usgs.gov>