Activity 1: Cause of the Eyjafjallajökull eruption

1. Figure 1 shows the build-up of magma beneath the Eyjafjallajökull ice cap prior to the eruptions in 2010.

   (a) Describe the shape and extent of the magma chamber.

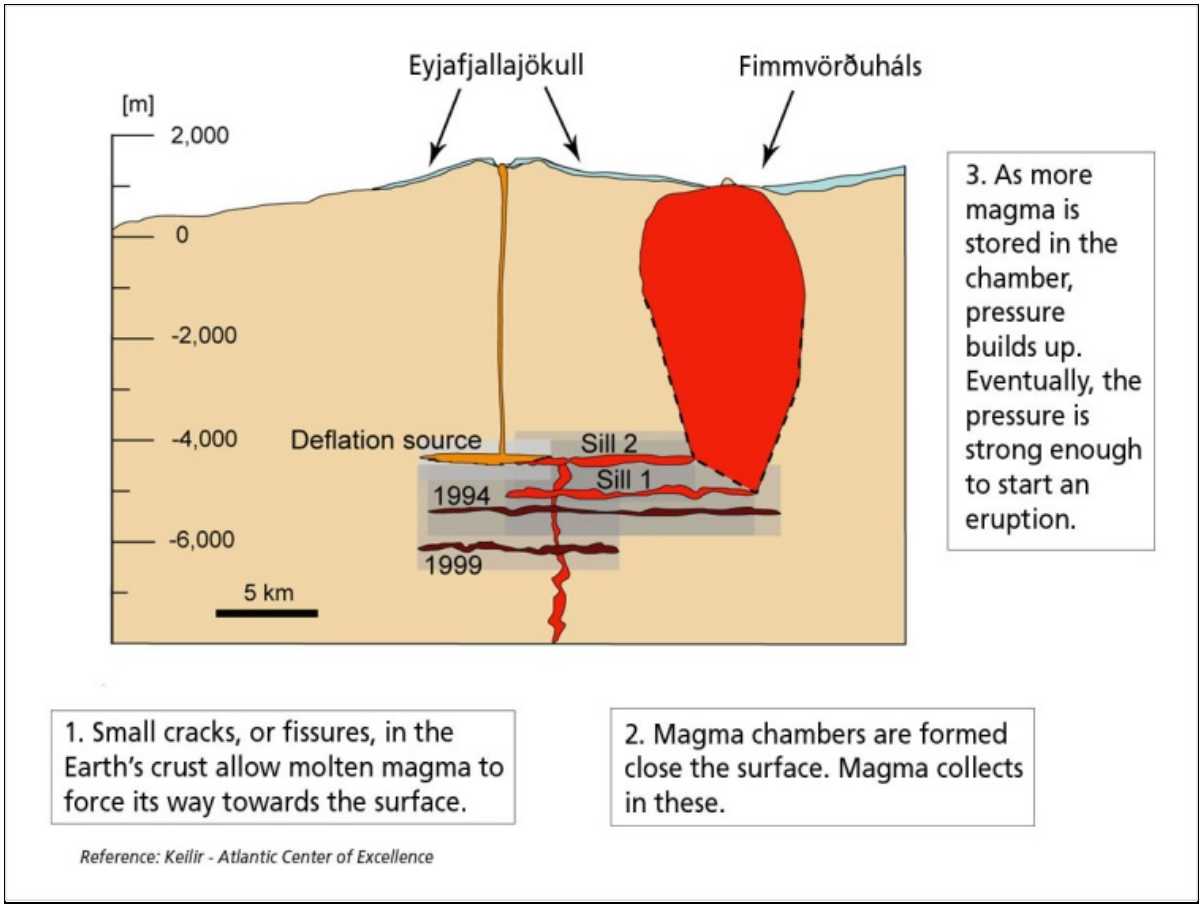
   (b) How does Figure 1 help to explain why there were two neighbouring eruptions in 2010?

   (c) A sill is a crack in between two layers of rock infilled with igneous rock (magma). The magma chamber was filled by magma flowing along Sill 1 and Sill 2. At what depths are these two sills?

   (d) What is the evidence that magma had been moving towards the surface since the 1990s?

(e) Suggest why earthquakes are caused by magma rising towards the ground surface?

Figure 1
Magma chamber beneath Eyjafjallajökull ice cap



Activity 2: Iceland - the tectonic background

2. Figure 2 shows the tectonic plates and active volcanoes in Iceland.

(a) Name the two tectonic plates in Iceland.

(b) Describe the movement of the plates.

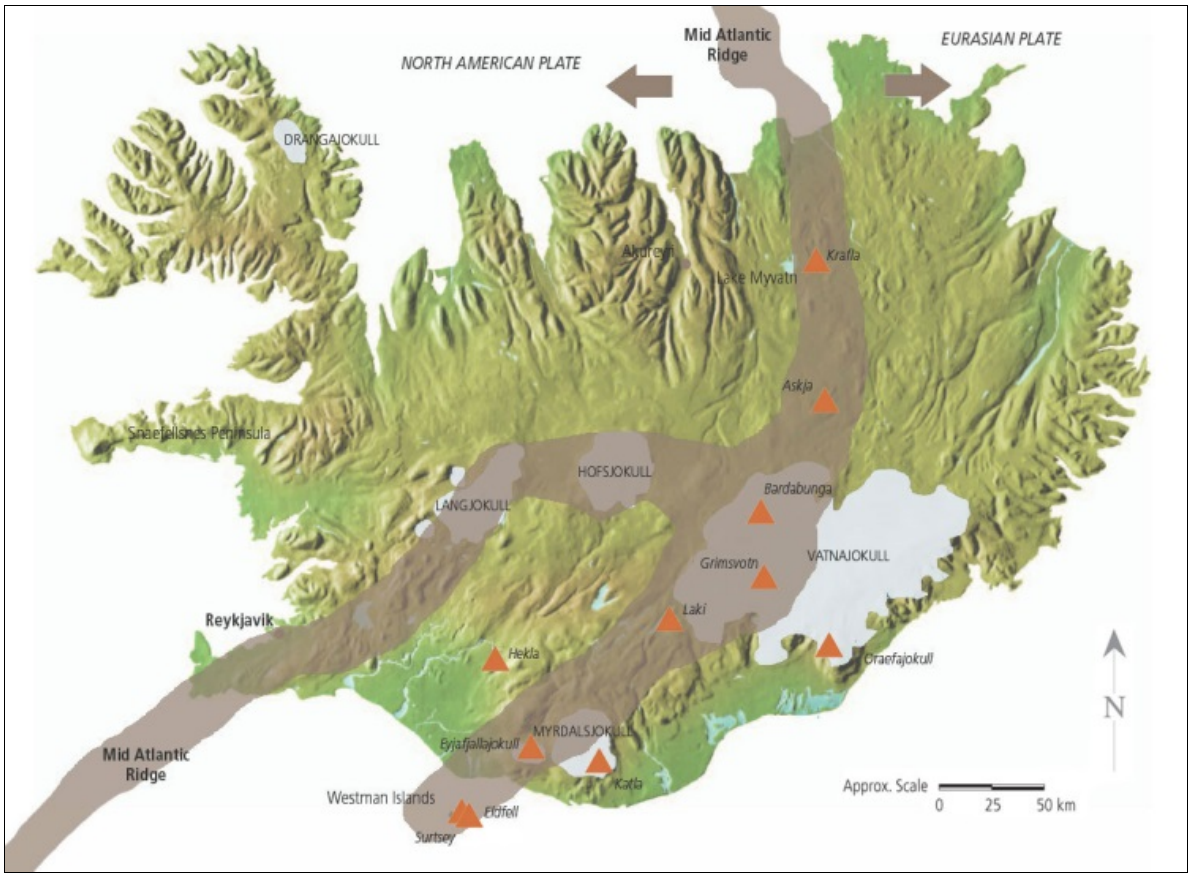
(c) How many active volcanoes are shown on the map?

(d) Under which ice cap is the volcano Katla located?

(e) Why are most of the volcanoes located at the plate margin?

(f) Use the internet to find out about the volcanic island of Surtsey.

Figure 2
Iceland's tectonic background



Activity 3: Flooding resulting from Eyjafjallajökull

3. Figure 3 is a map showing the extent of flooding following the eruption of Eyjafjallajökull .

(a) Describe the location of the active craters (central beneath the Eyjafjallajökull ice cap).

(b) Describe the course of the floodwaters that escaped from beneath the ice cap.

(c) Use the Internet to:

- name the glacier beneath which the floodwater emerged from the ice cap

---

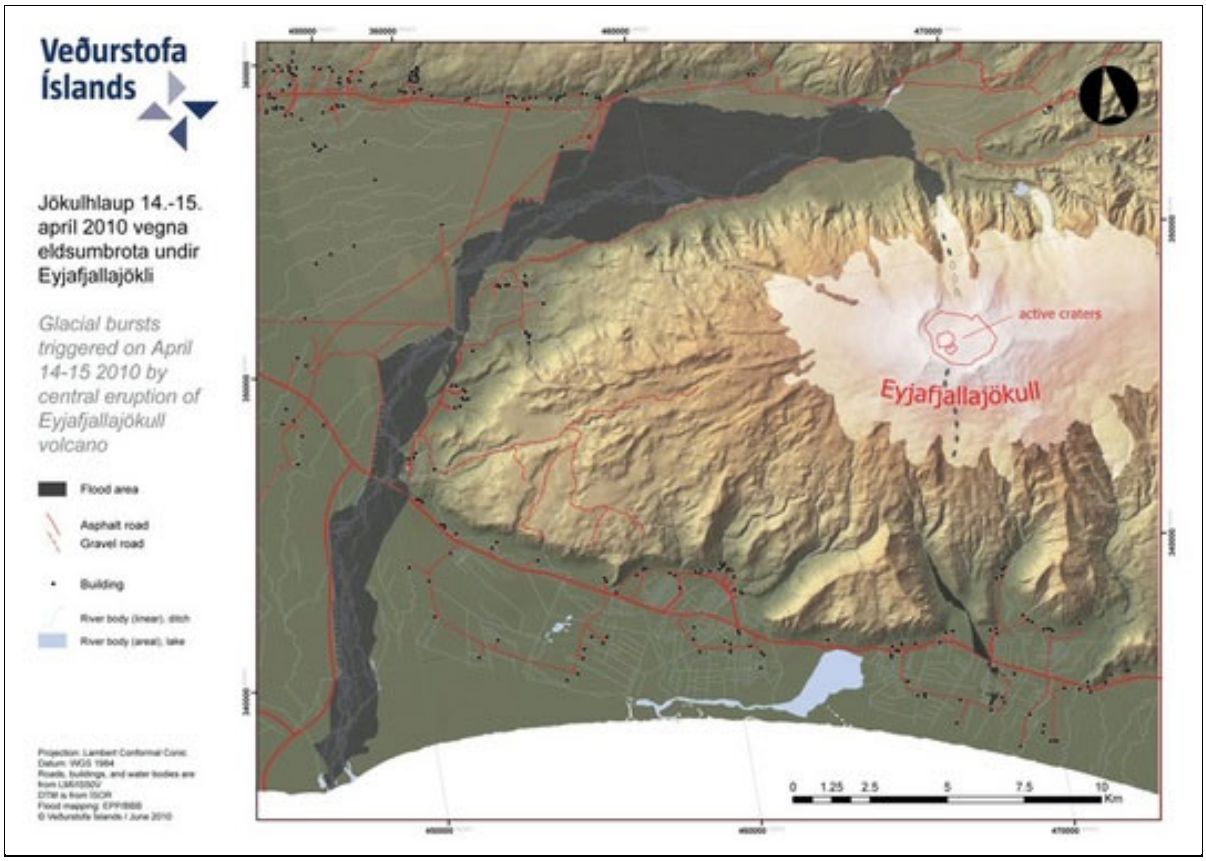
- name the river along which the floodwaters flowed

(d) Notice the straight edges of the flooded area shown on the map. These mark the position of artificial embankments. How successful were the embankments in containing the floodwaters?

(e) The main road in Iceland – the N1 – follows the southern edge of the mountain, crossing the Markarfljót River at the south-western edge of the mountain. Label this on Figure 3. Remember that quick action by road engineers breached embankments saving the metal bridge from being destroyed.

(f) If the river embankments had not been in place, suggest the possible impacts of the flooding on the area.

Figure 3
Flooding resulting from the eruption of Eyjafjallajökull



Activity 4: Using earthquakes to predict the eruption of Eyjafjallajökull

4. Figure 4 shows the epicentre of earthquakes recorded in the days prior to the first eruption in March 2010.

   (a) Define the term ‘epicentre’. How is it different from the earthquake focus?

   (b) What is the significance of the different colours?

   (c) Describe the location of the earthquake epicentres.

(d) Why does the increased concentration of earthquakes suggest that a volcanic eruption is likely? Use Figure 1 to help you.

Figure 4
Earthquakes recorded in the 48 hours before the March 2010 eruption