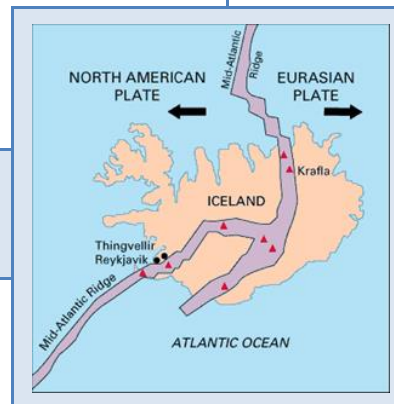


Explain the formation of the volcano E15 and the causes of its eruptions.

Describe the effects of the 2010 eruption. Make sure you can categorise these according to whether they are primary or secondary effects.

Case Study of a Volcanic Eruption - Eyjafjallajökull

Describe the eruption that happened in 2010.



Describe the responses to the 2010 eruption. Make sure you can **categorise** which were immediate, and which were long-term.

Information sheet 1: causes of the eruption



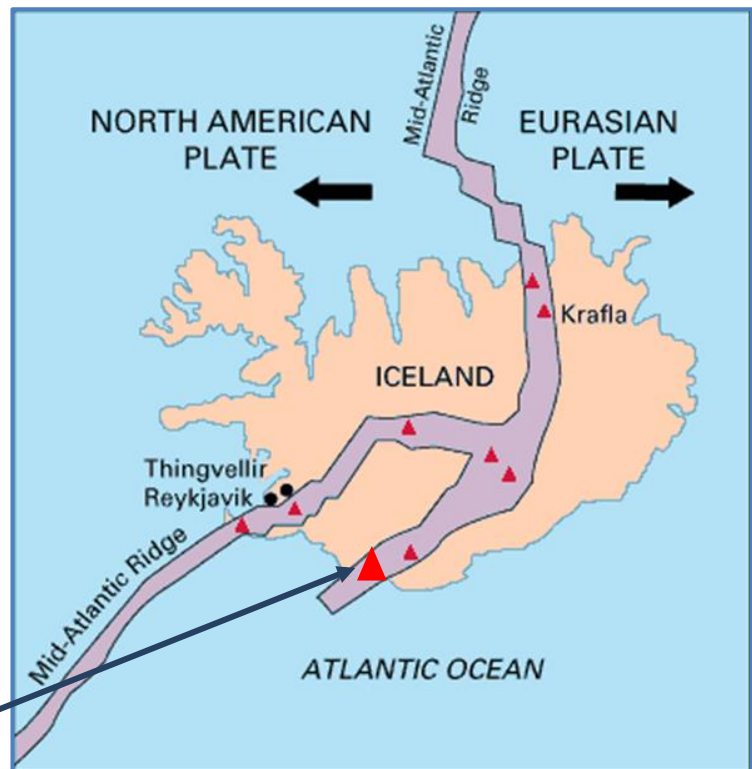
Iceland lies on the Mid Atlantic Ridge, a constructive plate margin.

The Eurasian plate is moving away from the North American plate. This is the result of convection currents in the Earth's crust that determine the direction of movement.

As they pull apart, a 'gap' is created between the plates. This is filled by magma rising up out of the mantle to plug the gap and constructs a new layer of crust.

As this occurs again and again, layers of lava solidify and build up to create volcanoes.

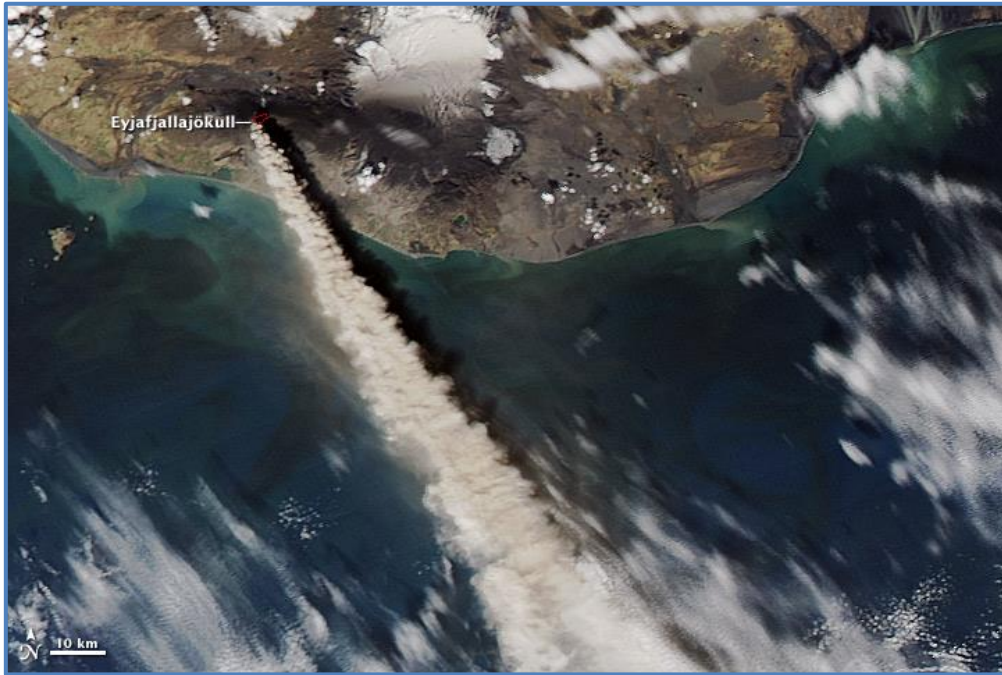
Eyjafjallajökull is one such volcano in Iceland, and is located beneath an ice cap in southern Iceland, 125km south of the capital city Reykjavik. The volcano is **1666m** tall.



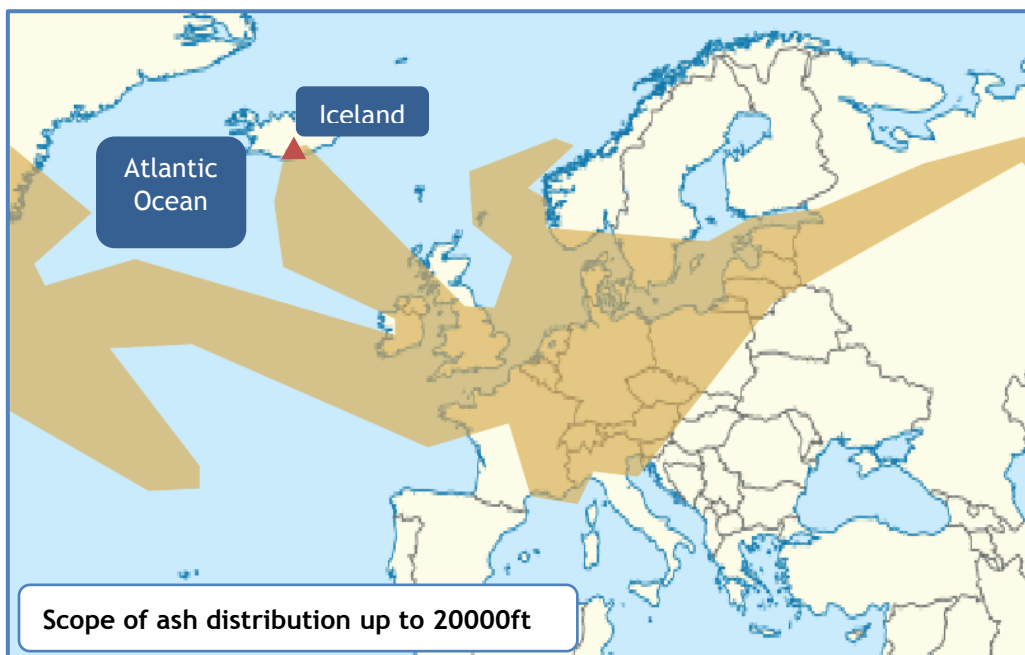
Eyjafjallajökull volcano

Information sheet 2: the eruption

In March 2010, magma broke through the crust beneath the Eyjafjallajökull glacier. This was the start of two months of dramatic and powerful eruptions that would have an impact on people across the globe. The eruptions in March were mostly lava eruptions. Although they were spectacular and fiery they represented very little threat to local communities.



However, on 14th April a new phase began which was much more explosive. Over a period of several days in mid-April violent eruptions released huge quantities of ash in the atmosphere. An ash plume rising 11000m into the air resulted from the eruption. The ash was very fine grained, and was distributed by high velocity jet streams above Iceland.



Information sheet 3: effects of the eruption

	Primary effects	Secondary effects
Local	The 150m thick ice cap above the volcano melted. Homes and roads were damaged, including 20 farms. Crops were damaged by the heavy ash falls. Local water supplies were contaminated with fluoride from the ash.	The melted ice caused major flooding. Around 700 people were evacuated because of this. Parts of Route 1 (the main road in southern Iceland) were damaged by the flood waters.
National	Agricultural production affected as crops were covered by a thick layer of ash.	Drop in tourist numbers which affected Iceland's economy and people's jobs and incomes. Road travel was disrupted due to road damage and closures.
International	Flights were cancelled across Europe and North America due to the ash in the atmosphere, around 100000 flights over an eight day period.	10 million air passengers had their travel disrupted. It is estimated the airlines lost over \$2 billion in total. Freight transport was disrupted, food and flowers produced in Kenya could not be flown to European supermarkets before they perished. Sporting events including the Japanese Motorcycle grand prix and the Boston Marathon were affected as people couldn't travel.



Information sheet 4: responses to the eruption

Immediate responses

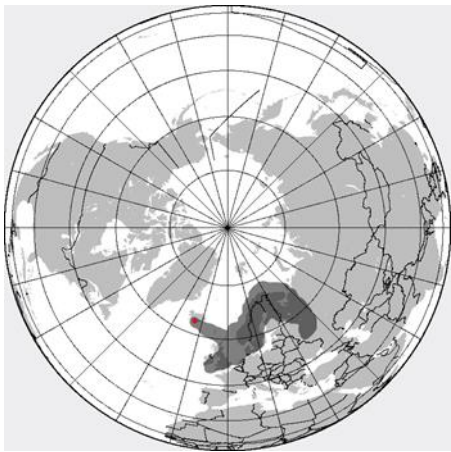
Icelandic Meteorological Office (IMO) put a 24/7 watch in place.

Farmers were told not to let animals drink from outdoor water sources as the high levels of fluoride caused by the eruption would be deadly to animals.

Some parts of Route 1 were removed by bulldozers to allow flood waters to drain into the sea and reduce the damage.

A warning system was used to send texts to people in Iceland.

Farmers were evacuated by the authorities.



Other countries started tracking the spread of the ash so they could make decisions about air traffic.

Large sections of airspace were closed down in response.

Long-term responses

Roads and embankments were reconstructed.

Route 1 was repaired and open again within a few weeks.

Compensation was provided to travellers who had been stranded.

New regulations were introduced for aircraft to follow in cases where volcanic ash might be a problem.

Some local farmers returned to their farms to carry on with their lives.

The volcano is now a tourist attraction. Farmer Ólafur Eggertsson and his family set up a visitor centre where they tell tourists their story and earn money from the visits.

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