

6.6 What Are the Hazards of Basaltic Eruptions?

BASALTIC ERUPTIONS usually only directly affect areas very close to the vent or more distant areas that are in the path of lava flows. Basaltic scoria is very localized, but basaltic flows are relatively fluid and can destroy buildings and crops tens of kilometers away from the volcanic vent. Surprisingly, they can also cause huge floods, if they occur in areas with ice sheets.

A What Is Meant by a Hazard and a Risk?

The terms *hazard* and *risk* may seem more appropriate for a lesson about insurance, but geologists frequently apply these terms when discussing the effects geologic events can have on humans and society. What is the difference between a hazard and a risk?



06.06.a1 Kilauea, HI

◀ A *hazard* is the existence of a potentially dangerous situation or event, such as a potential landslide of a steep slope or a lava flow erupting from a volcano. The hazard in this photograph was a basaltic lava flow.

Risk is an assessment of whether the hazard might have some *societal impact*, such as loss of life, damage to property, loss of employment, destruction of fields and forests, or implications for local or global climates. Remnants of destroyed houses, cars, and roads demonstrate that this area had a high risk for volcanic hazards.

The risk was extreme for people living on the flanks of an active volcano in central Africa (▲). In 1977, a fast-moving (50 km/hr) lava flow killed as many as 300 people living in villages near the volcano. If no people were living near this volcano, a hazard would still exist but there would be essentially no risk.



06.06.a2 Goma, Congo

B What Hazards are Associated with Eruptions of Basaltic Scoria and Ash, and Gas?

Basaltic eruptions can be deadly and destructive, especially to nearby areas. They hurl lava and solid rock into the air and spew out dangerous gases. Fine ash ejected high into the air can cause damage that is more widespread.

Falling Objects

Most scoria falls back to Earth near the vent and piles up on the scoria cone. Hazards that exist nearby include being struck and burned by cinders and being struck by blobs of magma and other projectiles. Larger ejected pieces, called *volcanic bombs* (▼), pose a severe hazard for anyone close to the erupting cone.

06.06.b2 Flagstaff, AZ



06.06.b1 Hawaii



Volcanic Ash

Sand-sized cinders and finer particles of ash can bury nearby structures, and may cause breathing problems for people and livestock. In March and April of 2010, a shield volcano in Iceland, called Eyjafjallajökull, erupted large amounts of volcanic ash that drifted over Europe, shutting down most air travel and stranding hundreds of thousands of passengers. Eruption columns from scoria cones typically reach lesser heights, of several kilometers, and mostly impact areas nearby.

06.06.b3 Iceland



Gases

Volcanic gases are a significant hazard associated with many types of volcanoes, including those with basaltic eruptions. Gases such as carbon dioxide (CO_2) cause asphyxiation if concentrated. Other gases, including hydrogen sulfide (H_2S), cause death by paralysis. Gaseous sulfur dioxide (SO_2), hydrochloric acid (HCl), sulfuric acid (H_2SO_4), and fluorine compounds expelled during eruptions can destroy crops, kill livestock, and poison drinking water for people and animals.

06.06.b4 Krafla, Iceland

