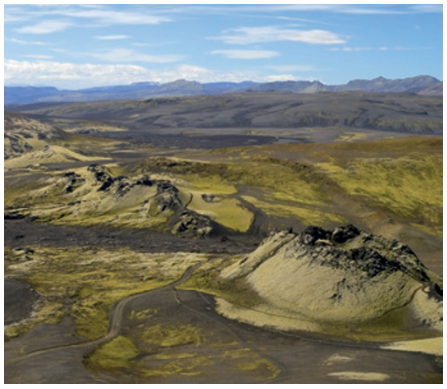
Iceland's impact

Twice in the past two years have ash clouds from Iceland led to flight bans on the European continent. According to an analysis by a research team led by Graeme Swindles of the University of Leeds in the United Kingdom, the cumulative disruption may not have been as exceptional as it might look: the team showed that, on average, Icelandic ash clouds drift to Europe about every 56 years (*Geology* **39,** 887–890; 2011). These events are not expected to spread evenly in time, so occasionally they occur at shorter intervals.

Yet the impact of volcanic eruptions in Iceland could be far worse than Europeans' experiences in the past two years. In 1783, an eruption of the Icelandic Laki volcano had catastrophic effects in Europe. Over a period of eight months, the volcano emitted just slightly more ash into the atmosphere than Eyjafjallajökull did in 2010 in a few weeks.

But the emission of sulphate particles and sulphur dioxide made the eruption deadly. More than 120 million tons of sulphur dioxide are thought to have been released into the atmosphere, an amount usually reached only in violent, once-in-a-millennium eruptions. The gases were distributed over a much larger area than the ash from the eruption, and were transformed into sulphuric acid in the atmosphere.



The impact was dramatic. The cloud of sulphuric acid blocked out the sunlight, and what was then called the 'great dry fog' blanketed Europe in a blue haze. Harvests failed for three years in a row, causing famines; acidic rain blighted plants; and people suffered from lung ailments. Tens of thousands of people died in Britain and on the continent. Some historians even believe Laki's eruption could have triggered the social unrest that culminated in the French Revolution in 1789.

Climatologists have now assessed the consequences a similar eruption would have today. Such an eruption would cause even more destruction, reports Anja Schmidt of the University of Leeds and her colleagues (*Proc. Natl Acad. Sci. USA* **108,** 15710–15715; 2011). The researchers used a meteorological model to simulate the distribution of a cloud of volcanic emissions like that thought to have risen from Laki in 1783, focusing in particular on the distribution of tiny sulphate particles.

They found that westerly winds would more than double the concentration of the smallest sulphate particles in Europe's air for three months after the eruption. Modern statistics on the effects of air pollution on human health help estimate the effects: up to 140,000 people could die as a result of the air pollution caused by an eruption of an Icelandic volcano that resembles Laki's 1783 eruption.

"Our study strengthens the argument that European governments need to start planning for the impact of sulphur-rich volcanic clouds, as well as volcanic ash clouds", says Marjorie Wilson of the University of Leeds, a co-author of the study. A sulphuric acid cloud from Iceland would pose the greatest threat to the elderly and ill. Europe has been warned. ❐

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The journalist's take

When I presented the study in our editorial meeting, we debated how we could best present an article about the paper. I argued in favour of a dramatic headline such as: 'Sulphuric acid clouds from Icelandic volcano could kill tens of thousands of Europeans'. I felt that the paper's findings were dramatic, so their reporting should be emphatic. After all, the probability that Europe could experience a catastrophic natural event seems far greater than negligible. My colleagues, however, favoured a more sober headline. Ultimately, we gave the story a more moderate title: 'Climatology: Deadly acids released by Iceland's volcanoes'.

The debate was typical for newsrooms that value a reputation for reliability. It is often difficult to assess the topic: the extent and potential impacts of geological events can be enormous, although their probability is unclear. In these circumstances, editors of high-quality publications tend to prefer a cautious presentation over a more dramatic take.

Yet urgency in a description of natural disasters can prove helpful. In his widely read thriller, *The Swarm*, author Frank Schätzing vividly explained how the sea receded far from the shore just before a tsunami struck. Several of his readers' lives were saved on southeast Asian beaches on 26 December 2004, because they knew what was coming when they encountered the same phenomenon — and ran to high ground.

At *Spiegel Online*, we occasionally receive letters from scientists who accuse journalists of panic mongering, particularly in the wake of articles about possible volcanic eruptions. This is no coincidence: volcanoes frequently transmit potential signs of an impending catastrophe. But often, this activity recedes later. Sometimes, however (and most recently in September 2011), residents of the area around a volcano had to be evacuated just a few days after we received such a critical letter from a scientist.

Journalistic articles, just like scientific papers, must provide precise, clear information about the probability of disaster threats. They must inform the public as accurately as possible about the probability of catastrophic geological events — without sounding the alarm so often that no one will listen.

In our editorial offices, we concluded that the threat of an acidic cloud emitted from Laki affecting Europe was not immediate enough to emphasize the possibility of tens of thousands of deaths in the story's title. We ran the article about Laki as the lead story nevertheless, because it comprised:

- Timeliness: public interest in Iceland's volcanoes is high, after two ash clouds have affected European air traffic.
- Political relevance: governments may need to act.
- Reader identification: the disaster has the potential to affect Europeans or Americans — depending on the prevailing wind direction.