

Is Katla Ready to Erupt?

By John L. Casey

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Just over the North Atlantic Ocean from the United States lies a geophysical threat that may be close to unleashing hell on Earth. It is Iceland's dangerous Katla volcano.

So why the current concern? The reasons are steeped in the history of activity of both Katla and its little sister volcano Eyjafjallajökull ("E" for short), and the start of our next climate change to decades of low solar activity and potentially record cold weather.

If you are unconcerned about the Katla volcano becoming active in Iceland, I will give you six good reasons in this commentary as to why we in the US and elsewhere around the planet, should have this one under close scrutiny.

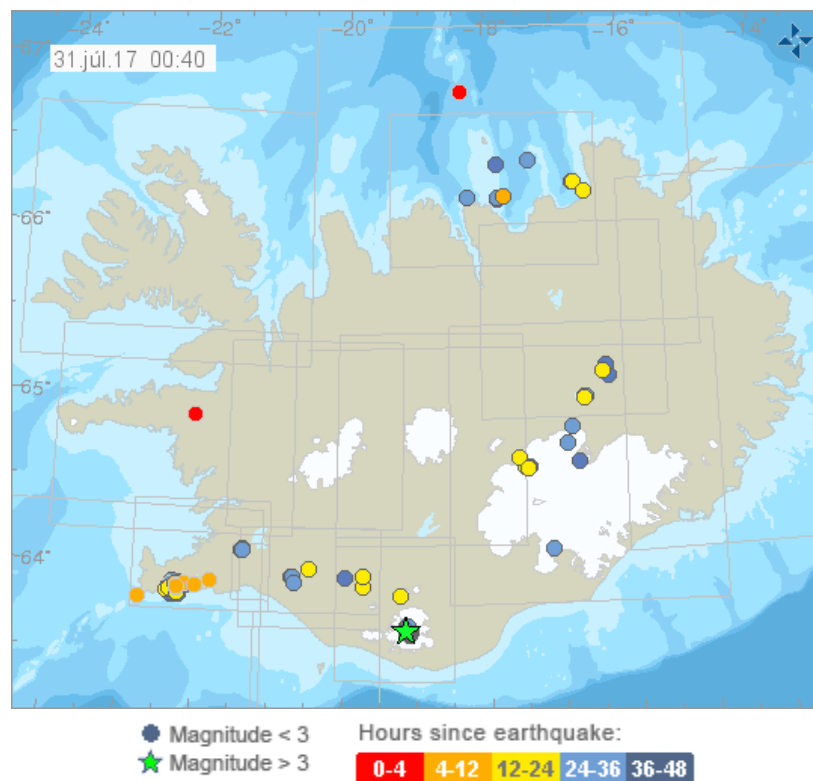


Figure 1. Map of Iceland showing earthquakes on July 31, 2017. Small colored circles are less than M3.0 magnitude. The only quakes greater than M3.0 are marked by the green star – the location of Mt. Katla which is beneath the Myrdalsjökull glacier. Source: Icelandic Met Office.

Here are some reasons to watch Iceland:

1. Katla is a monster in terms of size and explosive capability.

When and if it erupts, it may equal or exceed the power of the Mt. Pinatubo 1991 eruption that lowered global temperatures between 1991 and 1995, as it spread aerosols and noxious gases around the planet. Pinatubo and Katla both have the ability to produce eruptions at a level “6” of what is called the Volcanic Explosivity Index (VEI). To compare, Mt. St. Helens which erupted May 18, 1980, had a VEI of 5. Among the many Philippine villages and country side covered by Mt. Pinatubo’s volcanic ash was the huge American Clark Air Force base and the large US naval base at Subic Bay. About 722 people were killed, many from volcanic ash mud flows (lahars). Approximately 200,000 people were left homeless. Ample warning from seismologists and government enforced evacuations averted a much higher death toll.

2. The economic impacts on Europe and Russia could be significant - potentially affecting US trade with them.

Europe will be directly in Katla’s crosshairs from a major eruption as large or larger than the last big one in 1918. Like the 2010 eruption of “E,” which sent an ash plume out covering most of Europe and much of Russia, a Katla eruption would be far worse. “E” shut down air traffic in Europe from 15 to 20 April, 2010. The International Air Transport Association estimated the industry lost \$1.7 billion from the “E” eruption. If Katla, a much larger volcano erupts, it potentially could shut down air travel to and throughout Europe possibly for not just days, but for weeks if not months. US travel and trade revenues with Europe will take a big hit. Depending on the season, a worst case eruption of Katla could also have devastating consequences for European and Russian agriculture.

3. Recent earthquakes under the volcano may signal rising magma.

An M 4.5 earthquake under the volcano on July 26, 2017 and a small swarm of subsequent temblors may presage that all the pieces of this mean volcano’s story may be coming together, heralding another historic eruption. That size of an M4.5 quake would hardly be noticeable among earthquake familiar residents of California, yet this one ranks as very important since it took place virtually under the Katla volcano at a shallow depth of 10 km. As we all learned from the Mt. St. Helens volcano on May 18, 1980, earthquakes can be vital precursors to a volcano about to blow its top.

Importantly, this is a rare quake for Katla. Though two of equal strength hit there in August 2016, the three are the largest earthquakes at the volcano since a M5.1 hit in 1977. Though summer glacial melting produces small earthquakes under these glaciers, these rare M 4.5 size quakes could be a sign the sleeping giant is about to awake again, especially since the one this July produced a quick flood of melted glacier water which had a dark color and sulphurous

smell. The flash flood indicates at least a small Katla eruption under the Myrdalsjokull glacier took place.

In the Figure 2 below we see the area of Iceland containing the “E” and Katla volcanoes. Katla lies buried under the massive Myrdalsjokull glacier which has ice depths between about 700 feet and 2,600 feet. The recent M 4.5 quake was just to the southeast of the Katla caldera.

4. A major Katla eruption is overdue.

Past eruption intervals have ranged from a few years to 95 years. The VEI 5 eruption of 1918 was the last major eruption of Katla. That means we are at least four years overdue for another catastrophic eruption. It’s a highly risky proposition to be living near or downwind from a monster volcano like Katla that is overdue for another dangerous eruption.

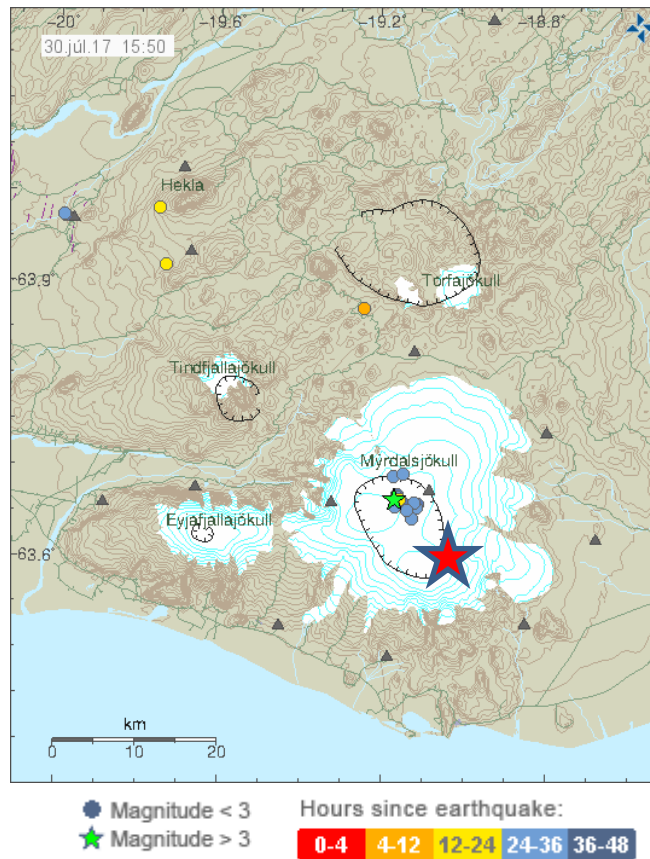


Figure 2. Map of Southeast Iceland, showing two major glaciers, Eyjafjallajokull and Myrdalsjokull, covering the “E” and Katla volcanoes, respectively. The green star indicates the location of two M3.0+ quakes plus swarm of smaller earthquakes (blue and yellow circles) under Katla on July 30, 2017. Another swarm of small quakes (not shown) was present July 29 to the left of the green star. These all followed the M4.5 quake (red star) that occurred on July 17, 2017. Map Source: Icelandic Met Office. M4.5 location via USGS.

5. Katla eruptions follow eruptions at Eyjafjallajokull (“E”).

Though it is not exactly one to one, the relationship between “E” eruptions and subsequent Katla eruptions is strong. Here is the eruptive history of the two:

“E”	Katla
920 AD	930 AD
1612 AD	1612 AD
1821-1823 AD	1823 AD
NA	1918 AD
2010 AD	TBD

Note the range of eruptions between the two volcanoes is from the same year to ten years later. This implies Katla could produce another VEI 5 (1918), or larger VEI 6 eruption between now and 2020. Given the long period (almost 100 years) for magma buildup in the chamber below Katla, we should not be surprised to see a massive eruption of at least VEI 5 or VEI 6. That equates to an eruption on a scale between Mt. St. Helens and Mt. Pinatubo.

6. A significant amount of research shows that our largest volcanic eruptions (and earthquakes) take place during extended declines in the energy output of the Sun.

We have now begun the early phase of the next grand solar minimum or “solar hibernation.” The so called “Eddy Minimum” will be fully installed during solar cycle 25 and 26 (starting in 2020) according to research done by myself and others. Major volcanic and earthquake activity has already started in some areas, during the steep decline in solar activity witnessed during the current waning phase of solar cycle 24. NASA has also confirmed we are entering a long term period of low solar activity. It turns out that eruptions of the Katla volcano are very much correlated to solar minimums as Table 2 below shows.

Table 2 – Relationship of Katla Eruptions to Solar Minimums

Year of Eruption	Associated Solar Minimum
920 AD	Mayan Minimum
1612 AD	Maunder Minimum
1823 AD	Dalton Minimum
TBD	Eddy Minimum (2014-2045)

As we are now entering yet another solar minimum there is good reason to be wary of Katla. Though the mechanism for linking large volcanic eruptions and solar minimums is not established, the correlation is nonetheless quite strong at 80% or higher, according to some studies.

This relationship between the Sun and catastrophic geophysical events has been thoroughly examined in my books, “Cold Sun” (2011) and its remake, “Dark Winter,” (2014). The most recent research into the tie between earthquakes in the USA and the Sun was documented in detail in a book made from years of collective research from a team of international scientists. The book, “Upheaval! – Why Catastrophic Earthquakes Will Soon Strike the United States,” was released in December 2016.

In addition, recent research for another island nation with a volcanic and earthquake-heavy history similar to Iceland, deals with earthquakes in New Zealand. This new research was published in the June 2017 issue of the New Concepts in Global Tectonics (NCGT) Journal (www.ncgtjournal.com). It likewise points to the need to be particularly attentive to Iceland or other earthquake prone nations during the Eddy Minimum.

The bottom line is that Katla or for that matter the Hekla volcano just north of Katla, or any of the several dangerous volcanoes on Iceland, may erupt at any time during the ongoing Eddy Minimum, with catastrophic results. This possibility is certainly not news to the seismology and emergency management experts in Iceland, who know their country and its volcanoes better than anyone.

What I am saying in this commentary is that there are now more reasons than ever before to be concerned, watchful, and prepared for what Iceland’s volcanoes may be about to deliver, especially with Katla.