

# Researchers document the 'life cycle' of a volcano

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Bezymianny is an active stratovolcano on the Kamchatka peninsula in eastern Russia. Credit: GFZ

Volcanoes are born and die—and then grow again on their own remains. The decay of a volcano in particular is often accompanied by catastrophic consequences, as was the most recent case for Anak Krakatau in 2018. The flank of the volcano had collapsed, sliding into the sea. The resulting tsunami killed several hundred people on

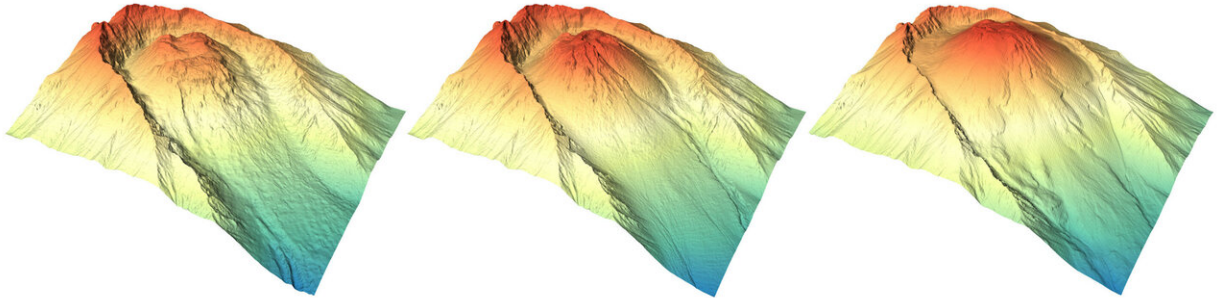
Indonesia's coast.

Continued [volcanic activity](#) after a collapse has not been documented in detail so far. Now, and for the first time, researchers from the German Research Center for Geosciences GFZ and Russian volcanologists present the results of a photogrammetric data series spanning seven decades for the Bezmianny volcano, Kamchatka, in the journal *Nature Communications Earth and Environment*. First author Alina Shevchenko from GFZ says, "Thanks to the German-Russian cooperation, we were able to analyze and reinterpret a unique data set."

Bezmianny had a collapse of its eastern sector in 1956. Photographs of helicopter overflights from Soviet times, in combination with more recent satellite drone data, have now been analyzed at GFZ Potsdam using state-of-the-art methods. The images show the rebirth of the volcano after its collapse. The initial re-growth began at separate vents about 400 meters apart. After about two decades, the activity increased and the vents slowly moved together. After about 50 years, the activity concentrated on a single [vent](#), which allowed the growth of a new, steep cone.

The authors of the study determined an average growth rate of 26,400 cubic meters per day—equivalent to about 1000 large dump trucks. The results make it possible to predict when the volcanic building may once again reach a critical height, after which it could collapse again under its own weight. The numerical modeling also explains the changes in stress within the volcanic rock and thus the migration of the eruption vents. Thomas Walter, volcanologist at the GFZ and co-author of the study, says, "Our results show that the decay and re-growth of a [volcano](#) has a major impact on the pathways of the magma in the depth. Thus, disintegrated and newly grown volcanoes show a kind of memory of their altered field of stress." For future prognosis, this means that the history of birth and collapse must be included to produce estimates about

possible eruptions or imminent collapses.



The pictures show the growth over decades after a volcanic collapse. Credit: GFZ

**More information:** Alina V. Shevchenko et al. The rebirth and evolution of Bezymianny volcano, Kamchatka after the 1956 sector collapse, *Communications Earth & Environment* (2020). [DOI: 10.1038/s43247-020-00014-5](https://doi.org/10.1038/s43247-020-00014-5)

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