

PRESS RELEASE

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Child of Krakatoa – why the 2018 eruption caused a tsunami

The volcano, Anak Krakatau ('Child of Krakatoa') located between Java and Sumatra collapsed in December 2018, causing a devastating tsunami which killed hundreds of people, displacing tens of thousands more living on the coasts of Indonesia. Recent scientific research has found that the tsunami was caused by an eruption-triggered landslide generated as the volcano collapsed into the Sunda Strait.

Anak Krakatau is a small volcano that formed in the caldera of Krakatau (Krakatoa) following its cataclysmic eruption in 1883 (which was the deadliest in recorded history with over 36,000 deaths and leading to global climactic impacts). The volcano first emerged above the waves in 1930 and reached a pre-collapse height of 327 metres above sea level. On the 22nd December 2018 an eruption led to the collapse of the south western flank of the volcano, with the resulting landslide generating a tsunami that caused devastation along the nearby coasts of southern Sumatra and west Java.



The cataclysmic eruption at 18:56 (local time), 22nd Dec 2018, which resulted in the volcanic landslide and tsunami (Andersen, O.L. 2018. Krakatau volcano: Witnessing the eruption, tsunami and the aftermath 22-23th December 2018. Accessed on December 26, 2018. <http://www.oysteinlundandersen.com/krakatau-volcano-witnessing-the-eruption-tsunami-22december2018/>)

The major factors that led to the collapse of Anak Krakatau were its location on the north eastern flank of a deep submarine trough (220 m deep), the migration of the volcano itself closer to the edge of the trough and the very weak base of the volcano which was formed of older volcanic deposits. In addition, over the last 90 years the volcano had grown very quickly to form a steep-sided cone of unstable volcanic material.

The results of modelling indicate that the landslide consisted of between 0.2 and 0.4 cubic kilometres of volcanic material. Initial numerical simulations of tsunami generation and propagation match to a high degree the recordings from tide gauges on the coasts of Sumatra and Java as well as observations recorded from eye witnesses.



Anak Krakatau 20 Days after the eruption and collapse, on the 11th January, 2019 (Reynolds J., 2019. Post-collapse image of Anak Krakatau. Accessed Jan. 11, 2019, on <https://twitter.com/hashtag/Krakatau?src=hash>).

Video of a numerical tsunami model here: [Numerical simulation of the tsunami from the Anak Krakatau eruption landslide of 22nd December 2018](#)

David Tappin, Marine Geologist of the BGS and Visiting Professor at University College, London, said: "This is the first major eruption-generated tsunami since the devastating Krakatau event of 1883 which killed over 36,000 people – it demonstrates yet again the lack of preparedness of countries threatened by tsunamis and highlights the urgent need for better mitigation and warning"

Professor Stephan Grilli, Numerical modeller at the University of Rhode Island, said: "Numerical modelling of eruption generated tsunamis is far less developed than for other tsunami mechanisms – such as earthquakes and landslides. The Anak Krakatau event is timely in that it should stimulate the development of new models that will underpin improved mitigation strategies"

Professor Tappin will present the findings of this research at the General Assembly of the European Geosciences Union (EGU) in Vienna on 10th April 2019.
<https://meetingorganizer.copernicus.org/EGU2019/session/32569>

This research was a collaboration between the British Geological Survey, UK; University of Rhode Island, USA; University College London, UK; University of Birmingham, UK; University of Santa Cruz, USA; and the Institut Teknologi Bandung, Indonesia. Funding for the research was provided by the British Geological Survey, the Natural Environment Research Council (NERC) and US National Science Foundation (NSF).

Ends



For further details or to arrange media interviews please contact:

Sarah McDaid Email: sarah@mcdaidpr.co.uk Tel. 07866 789688

Notes for Editors

The press conference details can be found here:

<https://www.egu.eu/gamedia/2019/press-conferences/#103>

NB The press conference will be live streamed from the same webpage.

The following are available for interview:

- Professor David Tappin, British Geological Survey

For additional information go to: www.bgs.ac.uk

British Geological Survey

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