Investigasi Pola dan Laju Deformasi di Bali: Analisis Berdasarkan Data Pengamatan Satelit Periode 2018-2019

Program Riset Top Tier 3P

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Abstract

This study investigates post-eruptive deformation at Mount Agung following the 2017 eruption using GNSS observations from five monitoring stations during January–July 2018. Deformation analysis and Mogi source modeling identified two deflation sources during each observation period, exhibiting distinct deformation patterns. The modeling results reveal progressive shallowing of both deformation sources, with the deeper source moving from 9.70 km to 2.80 km and the shallower source from 0.90 km to 0.02 km, indicating temporal changes in the location and characteristics of the deformation sources.

Keyword: Mount Agung; GNSS; source deformation; deep-source track, shallow-source track

Introduction

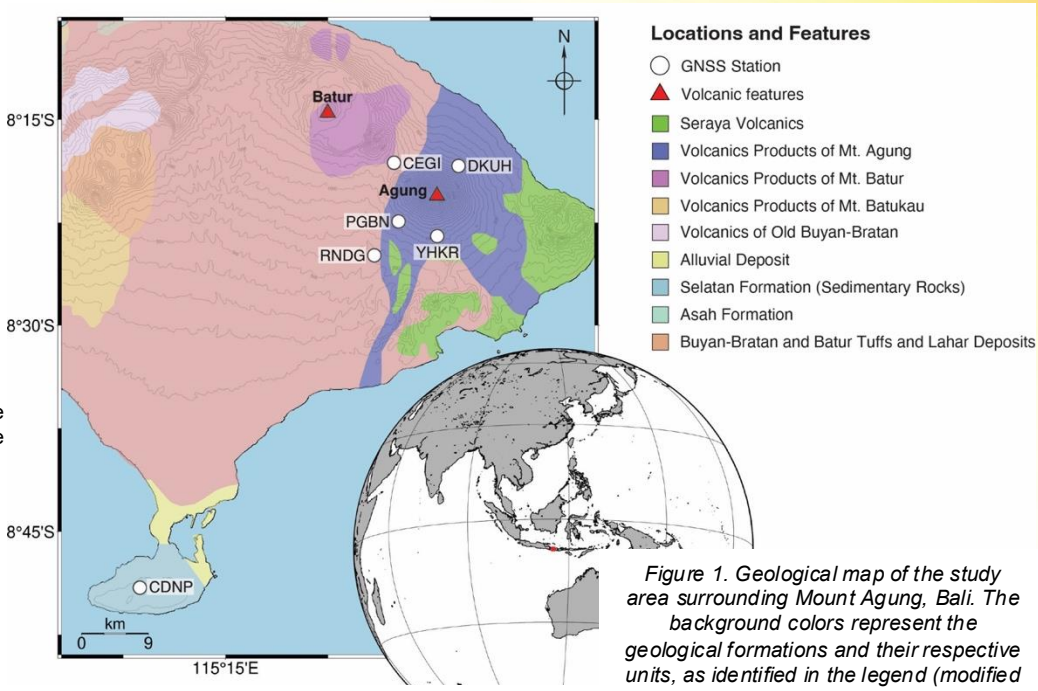


Figure 1. Geological map of the study area surrounding Mount Agung, Bali. The background colors represent the geological formations and their respective units, as identified in the legend (modified from Sutawidjaja, 2009)

Data & Method

- This study uses GNSS data from 5 stations available in the region.
- The model used in this study was the point source sphere model (Mogi, 1958).

Result & Discussion

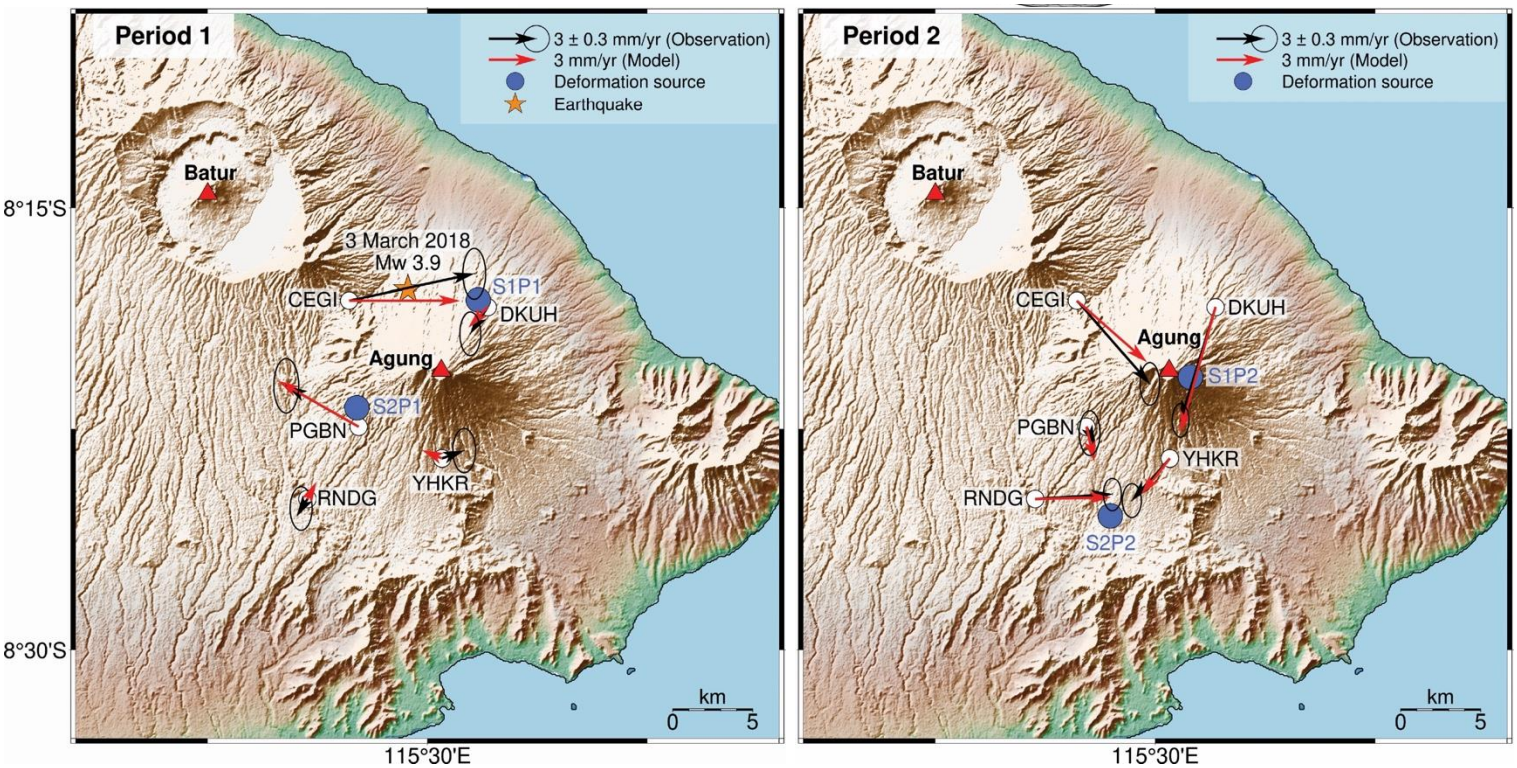


Figure 2. Analysis result of the deformation source location and displacement vectors for (a) Period 1 (10 January–28 May 2018) and (b) Period 2 (29 May–27 July 2018).

Conclusion

This study investigated post-eruptive deformation at Mount Agung in 2018 using GNSS observations from five stations and modeled using the Mogi point-source model. The observations were divided into two periods (January 10–May 28 and May 29–July 27, 2018), revealing variations in displacement patterns and magnitudes, with two deformation sources identified in each period. All station displacements were directed toward their associated sources, consistent with volume decreases. Correlating the sources across the two periods revealed two distinct source-depth tracks, both exhibiting progressive shallowing, with decreasing volume change in the deeper source and increasing volume-change magnitude in the shallower source, suggesting apparent upward migration of deformation sources.