

EGU2020-1423

<https://doi.org/10.5194/egusphere-egu2020-1423>

EGU General Assembly 2020

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## Multi-sensor satellite imagery analysis of the growth and collapse of a littoral lava dome during the 2018/19 eruption of Kadovar Volcano, Papua New Guinea

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Growing volcanic islands and lava domes become structurally unstable, associated with sectoral collapses, explosive volcanism and related hazards. We present the rare case of a growing and collapsing lava dome at Kadovar Volcano. This small inhabited volcanic island is part of the Schouten Islands, at the western end of the Bismarck Volcanic Arc, north of Papua New Guinea. The first confirmed historical eruption at Kadovar began on 5 January 2018 and was monitored by synthetic aperture radar (SAR), thermal and optical satellite sensors. Our analysis of the different remote sensing data shows that Kadovar began a new episode of volcanic activity at the central crater and then also at the eastern coast of the island, where we monitored the birth of a new emerging lava dome. We analyse changes occurring on the island and the littoral lava dome and identify that after dome growth (with an area of  $\sim 2,000$  m<sup>2</sup> area week), parts of the island and about 80% of the littoral lava dome collapsed eastwardly into the ocean on 9 February 2018. This collapse caused small tsunami waves that hit the neighbouring islands. The littoral lava dome then re-grew at a slower rate (of  $\sim 285$  m<sup>2</sup> per week) and reached a final area of  $\sim 40,000$  m<sup>2</sup> by 2 May 2018, which corresponds to an estimated subaerial volume of the lava dome of  $\sim 400,000$  m<sup>3</sup>. This study provides details on the rapid growth and collapse of a peripheral lava dome and a destabilization episode in an island and dome sector. The importance of remote sensing data for the monitoring and investigation of remote volcanic islands is demonstrated.