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Multi-disciplinary characterization of the June 2019 eruptions of Raikoke (Kuril Islands) and Ulawun (Papua New Guinea) volcanoes using remote technologies

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Retrospective eruption characterization is valuable for advancing our understanding of volcanic systems and evaluating our observational capabilities, especially with remote technologies (defined here as a space-borne system or non-local, ground-based instrumentation which include regional [15-250 km range] and remote [>250 km range] infrasound sensors). Two of the largest explosive volcanic eruptions of the past decade occurred in June 2019 at Raikoke, Kuril Islands and Ulawun, Papua New Guinea volcanoes. We integrated data from the International Monitoring System infrasound network, satellites (including Sentinel-2, TROPOMI, MODIS, Himawari-8), and globally-detected lightning (GLD360) with information from local authorities and social media to improve understanding of the eruptive behavior of these volcanoes. Remote infrasound data provide insight into changes in eruption intensity. During both eruptions, the infrasound peak frequency decreases upon transition to the Plinian phase. This may be related to changes in erupted jet and plume dynamics, such as an increase in vent diameter (observed in satellite). Our analysis illustrates the value of interdisciplinary analysis of remote data to illuminate eruptive processes.

Promotional text

Remote (non-local) infrasound data provide critical information in multidisciplinary characterization of two large volcanic eruptions in June 2019.

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