



## **Is the seismicity swarm at long-dormant Jailolo volcano (Indonesia) a signature of a magmatic unrest?**

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Magmatic unrest is challenging to detect when monitoring is sparse and there is little knowledge about the volcano. This is especially true for long-dormant volcanoes. Geophysical observables like seismicity, deformation, temperature and gas emission are reliable indicators of ongoing volcanic unrest caused by magma movements. Jailolo volcano is a Holocene volcano belonging to the Halmahera volcanic arc in the Northern Moluccas Islands, Indonesia. Global databases of volcanic eruptions have no records of its eruptive activity and no geological investigation has been carried out to better assess the past eruptive activity at Jailolo. It probably sits on the northern rim of an older caldera which now forms the Jailolo bay. Hydrothermal activity is intense with several hot-springs and steaming ground spots around the Jailolo volcano. In November 2015 an energetic seismic swarm started and lasted until late February 2016 with four earthquakes with  $M > 5$  recorded by global seismic networks. At the time of the swarm no close geophysical monitoring network was available around Jailolo volcano except for a broadband station at 30km distant. We installed last summer a local dense multi-parametric monitoring network with 36 seismic stations, 6 GPS and 2 gas monitoring stations around Jailolo volcano. We revised the focal mechanisms of the larger events and used single station location methods in order to exploit the little information available at the time of the swarm activity. We also combined the old sparse data with our local dense network. Migration of hypocenters and inversion of the local stress field derived by focal mechanisms analysis indicate that the Nov-Feb seismicity swarm may be related to a magmatic intrusion at shallow depth. Data from our dense network confirms ongoing micro-seismic activity underneath Jailolo volcano but there are no indications of new magma intrusion. Our findings indicate that magmatic unrest occurred at Jailolo volcano and call for a revision of the volcanic hazard.