

SO₂ emission monitoring of Mayon and Kanlaon Volcano in Philippines

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Mayon and Kanlaon are both active volcanoes in the Philippines. Mayon had unrest in 2014 that led to the formation of lava dome and the Alert Level was raised to Level 3 (Relatively High Unrest) on 16 September 2016. In 2015, Kanlaon had a series of phreatic eruptions and was raised to Alert Level 1 (Low Level Unrest) on 24 November 2015. During the periods of unrest, SO₂ emissions from Mayon and Kanlaon are measured using NOVAC ScanDOAS and Flyspec V3 respectively. Two (2) ScanDOAS instruments are strategically deployed around Mayon for full optimization of gas columns detection. Various scanning methods using Flyspec V3 were employed around the flanks of Kanlaon this year. During the Mayon 2014 unrest, a dramatic increase of SO₂ flux occurred from June to October with the highest recorded flux of 6253 ± 3023 tons/day on 14 September 2014. Prior to this increase was a recorded peak of soil temperature in May 2014. A peak in seismicity in September 2014 and short-term inflationary ground deformation in October 2014 were also exhibited. These parameters indicate that unerupted magma moved and then later degassed at shallow levels of the edifice. SO₂ flux in Kanlaon from May 11-July 18, 2016 range from 11 tons/day to 4470 tons/day. The flux during the phreatic eruption last 18 June 2016 was captured before, during, and after eruption. The flux before and during the eruption was 2325 ± 148 tons/day while the flux during and after the eruption was 4470 ± 388 tons/day. Baseline levels at Kanlaon are yet to be established. The lowest recorded Mayon SO₂ flux was on 24 January 2015 at 32 ± 6 tons/day. The Alert Level was lowered to Level 0 (Quiescence) in February 2016. Kanlaon Volcano is still at Alert Level 1 (Low Level Unrest) meaning there is no imminent eruption.