Satellite hot spot monitoring of active volcanoes in Japan and the adjacent areas using NOAA AVHRR-based system

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We developed a near real-time hot spot monitoring system for ten active volcanoes in Japan (Suwanose-jima, Satsumaio-jima, Sakura-jima, Aso, Izu-Oshima, Miyake-jima, Asama, Adatara, Hokkaido-Komagatake and Usu). The system uses daily nighttime infrared imagery from the AVHRR sensor mounted onboard the NOAA series of polar orbiting satellites, AVHRR data being down-linked to Tokyo one or more times every night. The results and analyses of the AVHRR observations, essentially thermal images and time-series radiance trends of each volcano targeted, are automatically uploaded on the WWW. In this way it is planned that volcanologists and other interested parties might use the AVHRR data as a broad check on the surface thermal state of the volcanoes they are studying and may apply their own interpretations to any identified heating or cooling trend. In three years of trial operation, we detected thermal anomaly at six volcanoes: Suwanose-jima, Satsuma-iojima, Sakura-jima, Aso, Miyake-jima and Asama. Particularly, in Miyake-jima, we recognised a temporal variation in thermal anomaly which changed corresponding to the eruptive activity: occurrence of thermal anomaly at the time when emission of large amount of SO2 started at the end of August 2000, and peaks in the variation at volcanic glow observed at the end of 2001 and 2002. The system will be expanded to include those in the northern Philippines, the Kuril Islands and the Kamchatka peninsula, along with volcanoes in Western Indonesia using data transferred from the Thailand AVHRR receiving station. The web site for the AVHRR based system is accessible at the URL: http://vrsserv.eri.u-tokyo.ac.jp/REALVOLC/.