Recent activity of Taal volcano (Philippines) inferred by electromagnetic and other geophysical monitoring networks

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In 2003, PHIVOLCS (http://www.phivolcs.dost.gov.ph) and the IUGG Inter-Association EMSEV (http://www.emsev-iugg.org/emsev/) initiated a cooperative geophysical monitoring program on Taal volcano. Taal is responsible for serious hazards in the region such as pyroclastic flows, base surges, and violent phreatic explosions. No eruption was predicted and nowadays 650,000 inhabitants are living in a radius of 20 km from the volcano summit. Considering the past historical activity, the volcano should have already erupted with 93% of probability.

In 2004, joint campaigns started to image the hydrothermal system, the geological and tectonic discontinuities with combined magnetic, electric, ground temperature and soil degassing surveys. Audiomagnetotellurics and resistivity soundings, magnetic and bathymetric mappings of the inner acidic lake, and bottom lake temperature were also performed. Results are now used in information planning.

A real-time monitoring network based on electromagnetic and other geophysical parameters as magnetic and electric fields, ground temperature and gradients, seismicity, and tilt has been built. Thanks to the network, anomalous signals were observed before and during the 2010 seismovolcanic crisis. During this crisis, PHIVOLCS raised the alert level from 1 to 2, requiring a partial evacuation of the volcanic Island.