Highlights of the Improved Seismic Monitoring Network of the Philippines: Remote Monitoring of Seismic Swarms

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Seismic swarms near inhabited areas raise concern in affected communities in the Philippines. Swarms are characterized by the continuous occurrence of hundreds to thousands of recorded earthquakes in a particular region within several days without culminating in a large earthquake. Communities may experience several earthquakes within a day inspiring fear of an impending destructive event. One of the basic tasks of the Seismological Observation and Earthquake Prediction Division of the Philippine Institute of Volcanology and Seismology (PHIVOLCS) is to monitor these events and issue timely advisories to the public. Monitoring seismic swarms prior to the establishment of the new seismic network of PHIVOLCS entailed sending of a Quick Response Team composed of several personnel whose main tasks are to deploy a temporary network of short-period seismographs to characterize the swarm and to conduct education and information campaigns for disaster mitigation. The temporary network is usually established with a delay of several days after the start of the on-going swarm, failing to provide a complete record of the events. Since the improvement of the PHIVOLCS seismic network with densification of stations (from 34 in 1998 to 64 in 2004) and shift from analog to digital seismographs, swarms are now better monitored. The satellite-telemetry network of 30 unmanned stations allows remote monitoring of swarms from start to end of the activity. This work will present the efficiency as well as the limitations of the new PHIVOLCS seismic network through the inventory and characterization of the swarms it recorded since its establishment. This will include the swarms of Surigao del Norte (2007), Marinduque Island (2006), Lubang Island (2006), Masbate (2006), Babuyan Island (2004), Pagadian (2004) and Antique (2004). Also to be presented will be swarms which did not affect any community but whose occurrences were captured by the new network. The relations of these swarms with the history of faulting and generation of large earthquakes in corresponding seismogenic zones will be discussed. Finally, the evolution of aftershocks distribution of the 2003 Ms=6.2 earthquake that produced ground rupture and damage in the island of Masbate will also be presented.