

## THE JANUARY 2020 ERUPTION OF TAAL DECADE VOLCANO, BATANGAS PROVINCE, PHILIPPINES: PRELIMINARY REPORT

***Bornas Ma. Antonia, Solidum Renato Jr. and the Quick Response Team***

*Department of Science and Technology-Philippine Institute of Volcanology and Seismology (DOST-PHIVOLCS)*

### ***Quick Response Team:***

*(PHIVOLCS): Abang Angelo, Abigania Ma. Isabel, Aggangan Brian, Andal Niño Jose, Arcenas Jude, Bacolcol Teresito, Bañes Lawrence Aaron, Barairo Ma. Concepcion, Bariso Ericsson, Bas Paul, Bernardo Allan, Buhay Daniel, Cabrera Alex, Capa Maricel, Catapang Mary Jane, Clarito Christian, Cordon Jojo, Cosalan Princess, De Lima Jerome, Delos Reyes Perla, Doloiras Dynie, Dominguiano April Angelique, Emerenciana Dave Benedict, Fernandez Deborah, Figueroa Melquiades II, Lamella Ruben, Jumawan Lois, Lacson Rudy, Llamas Deo Carlo, Lim Robjunelineaa, Loza Allan, Macagga Rose, Malipot Gerald, Mallorca Jude, Mangahas Robelyn, Marfito Brian, Martinez Arvin Jay, Olayta Lincoln, Pagtalunan Melcario, Papiona Katherine, Quilalang Ma. Theresa, Quintia Mari-Andylene, Rebadulla Raul Ryan, Reniva Paolo, Rivera Danikko, Rivera Dave Andrei, Sayco Micah Angeli, Seda Ricardo, Sena Nerissa, Sevilla Winchelle Ian, Tungcul Lyca Marie, Velasco Louie, Visayana Mark Lester, Vitto Kimberley; (USGS-VDAP) Battaglia Maurizio.*

### **Abstract:**

Taal Volcano Island (TVI) began eruptive activity at its Main Crater on 12 January 2020, ending 43 years of repose. Alert Level 1 had been raised since March 2019 and reinforced with an advisory in December 2019 as elevated VT seismicity and continuous edifice inflation persisted. Unrest began with precursory earthquakes at UTC 0300h 12 January that initiated phreatic activity at 0500h concurrent with the onset of abrupt rapid tilt but sans physico-chemical changes in the Main Crater Lake. Verbal notifications at ~0500h from PHIVOLCS to local village heads and government officials led to successful evacuation of human populations from TVI earlier than official issuance of Alert Level 2 at 0630h. The onset of weak phreatomagmatic activity was recorded visually at 0640h and of explosive activity at ~1000h coincident with peaks in seismic energy release. Alert Levels 3 and 4 were raised at 0800h and 1130h, signalling evacuation of PDC-prone communities around Taal Lake.

Peak activity until 1600h generated an eruption plume ~16 kilometers tall that dispersed ash over Batangas Province and areas ~100 kilometers north of TVI. This was followed in the next four days by VT and hybrid earthquakes along a northeast-trending inclined magmatic dike southwest of TVI and along-strike fissuring across Taal Caldera. Continuous GPS data recorded significant post-peak abrupt extension of the caldera, uplift of its northern sector and subsidence of TVI consistent with field observations of lakewater recession and coastal submergence. The eruption waned by 13 January and ended on 19 January. A total of 30-40 million cubic meters of erupted magma was approximated from GPS inversion and tephra dispersal mapping, consistent with VEI3.

We discuss the outcomes of ten years of preparation for unrest at Taal that involved strategic monitoring network development, past eruption research, community engagement and education campaigns.