

EGU2020-11838

<https://doi.org/10.5194/egusphere-egu2020-11838>

EGU General Assembly 2020

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Field Survey of the 2018 Anak Krakatau Tsunami on the Islands in the Sunda Strait

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On December 22, 2018, an eruption and partial collapse of the Anak Krakatau volcano generated a tsunami in the Sunda Strait. The tsunami caused catastrophic damage and more than 400 deaths in coastal regions of the Sunda Strait in Lampung (Sumatra) and Banten (Java). An international tsunami survey team (ITST) was deployed 6 weeks after the event to document flow depths, runup heights, inundation distances, sediment deposition, impact on the natural environment and infrastructure. The 4 to 9 February 2019 ITST focused on islands in the Sunda Strait: Rakata, Panjang, Sertung, Sebesi and Panaitan. The survey team logged more than 500 km by small boat. The collected survey data includes almost 100 tsunami runup and flow depth measurements. The tsunami impact peaked along steep slopes facing Anak Krakatau with an 85 m runup on Rakata and an 83 m runup on Sertung. The extreme runup heights were within less than 5 km of Anak Krakatau. Flow depth reached more than 11 m above ground on Sertung where a boat landing was possible and trees remained standing. On Sebesi Island located 15 km northeast of the source tsunami runup heights remained below 10 m. In contrast, tsunami heights exceeding 10 m were observed in the Ujung Kulon National Park located 50 km southwest of Anak Krakatau. The runup distributions on the islands encircling Anak Krakatau highlight the directivity of the tsunami source with the Anak Krakatau collapse towards the southwest. Inundation and damage were mostly limited to within 400 m of the shoreline given the relatively short wavelengths of volcanic tsunamis. Significant variation in tsunami impact was observed along shorelines of the Sunda Strait with tsunami heights rapidly decreasing with distance from the point source. Field observations, drone videos, and satellite imagery are presented. The team interviewed numerous

eyewitnesses based on established protocol and educated residents about tsunami hazards. The tsunami caught the locals off guard despite the history and a six-month long eruptive activity in the lead up. Community-based education and awareness programs are essential to save lives in locales at risk from locally generated tsunamis. The 500 m initial height difference between the 1883 Krakatau and 2018 Anak Krakatau collapses provides a perspective on these two tsunamis. Remaining and future tsunami hazards will be affected by volcanic edifice regrowth.