Geophysical Research Abstracts
Vol. 19, EGU2017-1483, 2017
EGU General Assembly 2017

The December 2015 debris flows triggered by Typhoon Melor in Baco, Oriental Mindoro, Philippines

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On 15 December 2015, Typhoon Melor made landfall in Oriental Mindoro, bringing heavy rains that generated debris flows in multiple watersheds in Baco Municipality. Satellite images before and after the event display distinct differences in vegetation cover; clusters of landslides in the new image document that most of the rain fell in the mountains between Oriental and Occidental Mindoro. Rocks, soil, and debris delivered by the landslides to mountain stream networks were remobilized into debris flows that destroyed numerous houses and structures on alluvial fans. Fortunately, most residents evacuated their homes, minimizing loss of life.

In this study, the debris flows triggered by Typhoon Melor in Baco are described, historical typhoon tracks of Mindoro island are plotted, and the validity of anthropogenic triggers are evaluated. Rainfall values from the only automated rain gauge functioning at the time were extrapolated to 4-hour average intensities and were plotted against their corresponding durations in the 24-hour time frame. However these records are unreliable because the rain gauge was located on the low-lying plains, and not on the mountains which would have recorded the actual amount of rain that dislodged the debris further downstream. Measures to mitigate damages from future debris flows are discussed, including the installation of more rain gauges in the upper watersheds.