Quantifying damages brought by tropical typhoons using remote sensing

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Among the world's basins, the northwestern pacific ocean has the most number of tropical storm occurrence with an annual average of twenty six from 1981-2010. Many countries including China, Hong Kong, Japan, Korea, and Philippines are affected by these storms. In the Philippines alone, around eighteen to nineteen tropical typhoons enter the country's area of responsibility and of those nine to ten make landfall. The large amount of rainfall that typhoons bring has a big impact in agriculture. According to the Climate Change Commission of the Philippines, from 1990 to 2006, the annual average damage of typhoons to the agricultural sector alone amounted to 184 million USD. Aside from damages in agriculture, strong winds brought by typhoons also result to damages in the infrastructure.

Remote sensing has been widely used in assessing damages from disasters. Compared with field survey, it is a cost effective tool. In this study we compared pre- and post-typhoon satellite images by calculating for different vegetation indices such as Normalized Vegetation Index (NDVI), Normalized Difference Infrared Index (NDII) and Enhanced Vegetation Index (EVI). We found that the largest change is calculated using NDII. We analyzed satellite images from Landsat 8 for tropical storms that passed by the Philippines and Japan. We also correlated the rainfall volume measured by rain gauges to the damages measured by the satellite images.

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