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The relative roles of wind, storm surge and inland flooding causing damage from Japan Typhoon

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The damage caused by typhoons in Japan is fundamentally different from hurricanes in the US. Japan is one of the most complex areas of the world for modelling tropical cyclone risk. Unlike simple continental coastline environments, insured exposures in Japan are spread across a mountainous archipelago of four main islands and numerous smaller ones. The largest cities are all situated in bays or on the backside of islands relative to the direction of approaching typhoons. Although typhoons can affect the tremendous concentration of insured exposure in the Tokyo Bay region, such scenarios are not the main driver of risk in Japan for a couple of reasons: sea surface temperatures off the coast south of Tokyo are not warm enough to sustain very powerful typhoons, the predominant northeasterly track orientation and the coastal geography near Tokyo make a direct hit of Tokyo less likely. However, the wind intensity is not the only hazard parameter to consider when modelling damage and insured loss in Japan. This contribution is based on the analysis of damage data held by the various organizations in Japan, and discusses the relative roles of the hazards wind, storm surge and river flooding in the various regions of Japan.