

# Natural Catastrophe Data Analytics Exchange (NatCatDAX) Platform Features

## Summary

Under the Natural Catastrophe Data Analytics Exchange (NatCatDAX) program, the Institute of Catastrophe Risk Management (ICRM) at the Nanyang Technological University (NTU), Singapore, has developed Economic Exposure and Loss Databases (EED and ELD) for the South East Asian countries of Indonesia, Philippines and Thailand. The databases have been mounted on a NatCatDAX platform with built-in apps for

- Portfolio Enhancements – policy location geocoding and inferences, and attribute augmentation
- Underwriting and Pricing – Geospatial processing tools
- Accumulation Analysis
- Reinsurance Aggregates – disaggregation of submission data
- Scenario Analysis – user portfolio performance under selected past major loss events

### *By-building exposure resolution for Bangkok, Jakarta and Manila*

Three dimensional building attributes developed using high-resolution satellite-based stereo-images under strict QC/QA process.

- Local surveys in combination with cities' municipal data, both public- and private-source data to define building attributes
- Building attributes include footprint area, building height (# of storeys), total floor area, construction material, occupancy, presence of basement, and building age
- Valuation based on city-specific construction cost applied to each building, in effect equivalent to a by-building census of each city.
- Unparalleled high resolution coverage comprising 2.5 million buildings across Bangkok, Jakarta and Manila.

### *Administrative level exposure resolution for Indonesia, Philippines and Thailand (non-capital regions)*

- Province level for Indonesia and Thailand, administrative region for Philippines
- Valuations based on application of algorithms using Gross Fixed Capital Formation data accounting for asset growth and retirement, and cross-validated against by-building exposure in the capital cities.

### *Hazard Layers*

- Probabilistic earthquake hazard maps for S.E. Asia (475 and 2,475 Year Return Period)
- Catalogue of S.E. Asia earthquake events over 1900 – 2018 (USGS)
- Cat 2 and above Typhoon best track data for Western North Pacific Ocean over 1982 – 2018 (JTWC)
- Major Rivers
- Functions for user to upload additional hazard layers

### *Economic Loss Database*

- Catalogue of historical loss events, losses normalized to 2017 (accounting for inflation and asset growth and redistribution over time)
- Detailed loss analysis of five selected historical loss events (2011 Thai flood and 2013 Jakarta flood, 2004 Aceh earthquake and 2013 Bohol earthquake, and 2013 Typhoon Haiyan)

### *Platform and Data Security*

- NatCatDAX databases and platform are accessible through NatCatDAX issued licenses
- Application and User uploaded data reside on Client (User) end, ensuring complete user data security