



Asia rising: a model future

EQECAT is at the forefront of risk modeling in the growth markets of Asia and will soon release the first basin-wide Asia typhoon model. But as David F. Smith, Senior Vice President of EQECAT's Model Development Group explains, considerable challenges remain

Are insurers and reinsurers expanding their business in the region fully aware of the cat risks they may be exposed to?

EQECAT has played a leadership role in risk modeling in the region for more than a decade. Based on our experience, there is a high level of awareness with respect to earthquake, and also tsunami, in light of the February Chilean earthquake. This acted as a reminder of the 2004 Indian Ocean event and the ensuing tsunami. On the typhoon/cyclone side, the level of awareness seems lower. There have been some relatively significant flood losses from such events in the past few years, but nothing truly catastrophic for some time – and meanwhile, insurance exposures have grown considerably. Also, the uncertainties in exposure related to data resolution and quality are significant and probably not fully appreciated.

Compared to North American or European insurance markets, how well served are the Asian insurance markets by cat models?

Generally speaking, fairly well, but this is changing rapidly. For over 15 years, we have made significant investments developing models for this region: in developed countries such as Japan, and developing countries such as South Korea, Taiwan, China, India, Malaysia, Thailand, the Philippines, Singapore and Pakistan. However, in general, the availability, resolution, and quality of the exposure data for much of this region is lower than the United States, Canada, and much of Europe, for example.

Which are the standout markets?

Across the region the uncertainty of the models varies related to the quality and availability of the source data for the hazard and vulnerabilities. In addition, any recent loss activity can and does

help inform model development. The quality and availability of exposure data varies as well. At the moment only Japan is at a level of model uncertainty and exposure data quality that is comparable to the best-covered areas of North America and Europe.

Which markets does Eqecat cover and which perils?

Globally, EQECAT maintains 181 natural hazard models for 95 countries spanning six continents. We cover the perils of tropical cyclone, earthquake, and windstorm as relevant in all of these countries, as well as flood in Europe, and flood, tornado/hail, winter storm, and wildfire in the United States. This is the broadest coverage of any of the risk modeling firms. Throughout South and East Asia, EQECAT has typhoon/cyclone models for nine countries: Japan, South Korea, China, Taiwan, the Philippines, Thailand, Malaysia, India, and Pakistan. In addition, EQECAT has a cyclone model for Australia, an extra-tropical windstorm model for New Zealand, and earthquake models for all of the countries as well as Indonesia and Singapore.

What plans does Eqecat have in the area for new models?

EQECAT is very committed to this region and has a longstanding and active presence in these markets.

We will release the first basin-wide Asia typhoon model in July, covering Japan, South Korea, China, Taiwan, The Philippines, Thailand, and Malaysia. This is a fully detailed model that is on par with the most advanced risk models available globally, with a stochastic event set spanning the full range of potential typhoons comprised of about 150,000 events and their associated frequencies of occurrence. The model has detailed geographic resolution throughout the region, and risk-specific vulnerability functions better tied to

the performance of individual buildings than in prior models.

Having a single basin-wide event set is critical for companies having exposures throughout the region, as a single typhoon can easily impact multiple countries, and it is essential to capture these correlations appropriately in the model. Further, this model has been constructed to easily support geographic expansion into any areas affected by Western North Pacific typhoons, for example Vietnam. The event set and accompanying geographic data such as land use and elevations are complete across the region. To add a country like Vietnam will only require developing the specific vulnerability model.

We are also developing a new, detailed earthquake model for China. EQECAT already has detailed earthquake models for Japan, Taiwan, India, and Pakistan – all of these except Taiwan have been completely updated in the last three years.

What sort of challenges does Eqecat have ‘modelling’ in this region?

Understanding the local aspects of risk can be a challenge, particularly related to characterizing the vulnerability. To meet this challenge, we actively collaborate with the vast network of structural engineers that our parent company (ABS Consulting) has in the region. We also collaborate and partner with external wind engineering experts and academics in Asia, to help with various aspects of the vulnerability model. Another significant challenge is modeling the flood aspects of the risk, as these are generally a more substantial component of the losses than they are for Atlantic hurricanes.

In terms of available data?

Our models are built to accommodate a wide range of exposure data, from specific latitude/longitude coordinates to provinces, CRESTA zones, and other regional geographical conventions. This allows our clients to use the same model, regardless of the exposure data resolution. When only aggregate exposure data is available, exposures are disaggregated geographically and construction classes are assigned based on the relevant local distributions. This eliminates the need for different models to deal with different levels of data quality. We see this as a significant advantage.

With respect to the data used to build the model, the picture is mixed. On the hazard side, there is good coverage and quality of land use and elevation data, for example, and historical typhoon data – although the variety of meteorological organizations maintaining this data adds some complexity when compared to the Atlantic. There is little detailed data before 1945.

On the vulnerability side, the availability and resolution of historical loss information for much of the region is dramatically lower than for the United States and Europe, so this does present a challenge. EQECAT has addressed these challenges by working with local experts, both on the hazard side in terms of getting expert guidance on the most appropriate data sources and the methods to combine and calibrate them, and on the vulnerability side, getting input from wind engineers based in the region regarding regional variations in construction practices and quality, historical evolution of building codes and enforcement.

What are the unique perils and what particular challenges do they pose for the risk management community?

With respect to tropical cyclones, the main perils involved are wind, storm surge, and rainfall-induced flooding. The most difficult of these perils to model, rainfall-induced flooding, is of

particular importance in Asia, due to the meteorological environment and the fact that much of the region is mountainous. EQECAT is addressing the flood aspects of Asian typhoons in a staged approach. The initial release of the model will have detailed hazard and vulnerability modeling for wind, with loss results calibrated to the total losses from all three perils via elevation and geographically-based algorithms to appropriately reflect the storm surge and rainfall-induced flood losses spatially. A subsequent release that is well under development will provide detailed modeling for both flood perils in addition to wind.

As the local economies grow, will there be a need for specific exposure models like we see in US gulf energy, for example?

Definitely. Offshore energy is one such need that may develop, as there are significant energy production assets offshore that are exposed to typhoon or cyclone risk in Asia. This type of risk requires a lot of additional modeling effort – wave and mudslide hazards in addition to the wind hazard, a variety of specific asset types and vulnerabilities, and specific details of the exposure data and insurance conditions. Other risks that may require more specific modeling include electric power transmission and distribution assets, underground rail lines, engineering risks, specific industrial facilities, and marine cargo.

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As modelers strive to develop tools for Asia, what’s the best insurers and reinsurers can wish for in the meantime from Eqecat to aid their underwriting strategy?

EQECAT is committed to supporting the Asian markets, and in the past year or so has embarked on a new level of investment in the region. As mentioned, EQECAT is releasing the first basin-wide typhoon model this July, and is making significant investments in its earthquake models as well, with the current focus on China. EQECAT is also looking to expand its presence in the region, particularly with respect to product support and client relationship management.

We are also well into the EQECAT Transformation, a multi-year, multi-million dollar investment to provide for improved usability, increased transparency and a higher level of customer support. While all of our customers will benefit from the transformation, we are particularly excited about our continued expansion in the Asia markets.

We are hosting a conference on Asian Typhoon risk in Singapore on May 18 as a demonstration of our commitment to the region. This event will include CEOs from throughout Asia, as well sessions and a panel discussion with EQECAT clients and regulators from the region. ●

For more information, go to www.eqecat.com/ra10