RMS South Korea Typhoon Model

New model offers a comprehensive assessment of typhoon wind and flood risk to enhance the management of typhoon risk in South Korea

KEY FEATURES

- Risk assessed from separate or combined wind and typhoon-driven flood perils

- Hazard captured at high spatial resolution, using a foundation of over 100,000 years of simulated stochastic tracks to accurately model risk frequency and severity

- Over 1,700 primary vulnerability functions and additional secondary modifiers reflecting local design and build practices within different regions and for different lines of business

- Unique insights on the local insurance market and historical loss experience based on detailed collaboration with local insurance partners

- Extensively calibrated against both hazard and loss datasets during thoroughly established development process

More than 50 percent of insured catastrophe losses in South Korea are from typhoons and associated flooding. There is a recent trend toward increasing losses from severe-weather events, primarily due to growing urbanization. As many of the country's largest cities and industrial concentrations are in coastal regions, these areas are highly exposed to coastal flooding risk.

The RMS® South Korea Typhoon Model expands our suite of modeling solutions in Asia, providing a comprehensive and robust view using the latest science to capture risks from wind and typhoon-driven coastal and inland flood.

Complete View of Typhoon Risk

Typhoons bring a complex and interconnected set of hazards, including strong, damaging winds, heavy rainfall leading to floods, and storm surge resulting in coastal inundation. The South Korea Typhoon Model explicitly models typhoon-driven inland and coastal flood in addition to typhoon wind, to offer a comprehensive solution and reduce the impact of non-modeled risks.

The inland flood model starts with precipitation to capture both fluvial and pluvial risk, considering non-typhoon precipitation to determine antecedent conditions. For an accurate modeling of storm surge and associated tides, a hydrodynamic numerical model is used. The wind model features a new, innovative, and market-leading parameterization of wind fields for extra-tropical transitioning storms, developed in collaboration with academia, greatly improving loss estimates for locations at higher latitudes, including South Korea.

High-Resolution and Comprehensive Solution for Better Decisions

The South Korea Typhoon Model uses our proprietary variable resolution grid (VRG) to accurately calculate the wind and flood hazard for each event. This ensures that areas of high hazard or exposure are modeled at the highest possible resolution, which is particularly important for the flood peril because flood depths can vary significantly even within very short distances. Accurately modeling risk at high resolution allows for improved risk selection and pricing, assisting users in identifying the most profitable locations for writing new business and determining which areas are driving losses.

The model's foundation is a track set that simulates over 100,000 years of typhoon activity. The entire life cycle of each typhoon is modeled, including genesis, lifetime (including landfall), and lysis, with stochastic track parameters calibrated against 60 years of historical data. The stochastic track set represents the full spectrum of South Korea's landfalling and bypassing typhoons, providing a comprehensive risk assessment across the country. Capturing this range

of potential events allows for a robust determination of tail risk, enabling more informed reinsurance-based decision making and more accurate risk-based capital requirement calculations.

Expansive Vulnerability Module for Risk Differentiation

Building characteristics, including construction type and building height, can have a significant impact on the loss experienced from a typhoon event. The South Korea Typhoon Model contains over 1,700 vulnerability functions and three vulnerability regions to assess the losses for different building types from both wind and flood perils. To increase the accuracy of loss results, the model allows users to define secondary modifiers, such as basement information (highly influential on flood losses) and roof characteristics (important for wind loss estimation). Where primary building information is not available, the model will revert to the building inventory, developed using satellite data combined with detailed national building census data and regionalized by urban density to approximate the typical building characteristics for that location.

South Korea experienced heavy insurance losses in 2003 when Typhoon Maemi caused significant damage to the highly industrialized cities of Busan and Ulsan; similar concentrations of industrial risk are present elsewhere in the country. The supplementary Industrial Facilities Model (IFM) includes additional vulnerability curves for these types of risks and allows users to more specifically define the types of industrial exposure within their portfolios for more accurate modeled loss results.

High-Quality Calibration

RMS has over 20 years' experience modeling tropical cyclones in different regions of the world. During our strict development process, we calibrate and validate each model component individually, with extensive quality assessment and product acceptance testing processes. These well-established procedures ensure consistency between model components and overall losses and provide full transparency, so you can have confidence in the validity of the model results, understand your view of risk, and meet regulatory requirements.

Find Out More

For more information, visit **www.rms.com**, email **sales@rms.com**, or contact your RMS sales representative.