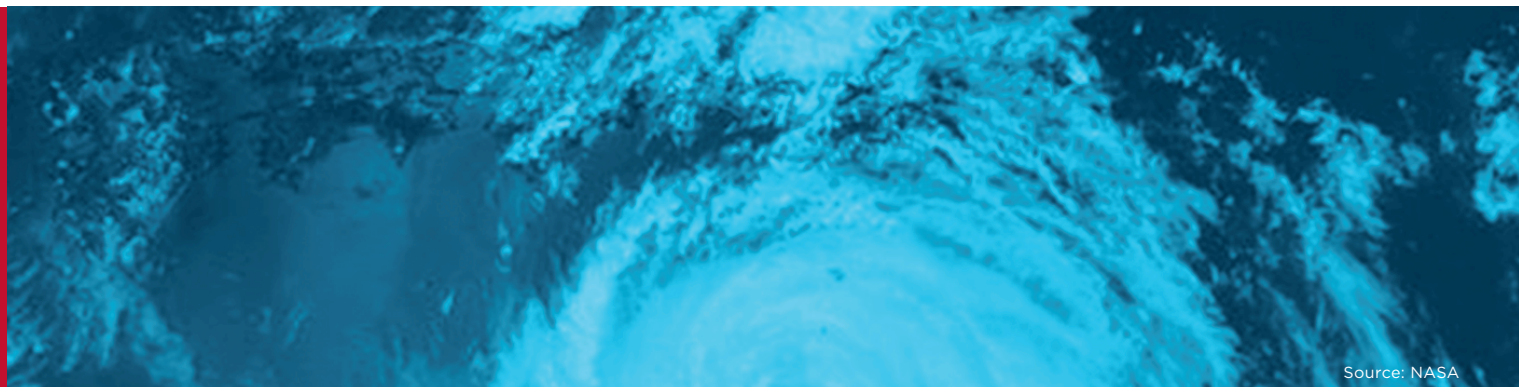




RMS Japan Typhoon HD Model

Understand and effectively manage your risk from both typhoon wind and typhoon flood within a high-resolution solution designed specifically for Japan.



Source: NASA

KEY FEATURES

- Explicitly models loss from typhoon wind, and typhoon-driven inland and coastal flood
- Model incorporates the latest RMS innovations in wind and flood modeling, including market-leading extratropical transitioning model
- Hazard is modeled at a high geographical resolution, with a ~35m resolution grid used to model typhoon flood
- Model includes over 5,000 unique region-dependent vulnerability curves
- Contains an update to the Industrial Facilities Model (IFM) and the addition of RMS® Builders Risk Model (BR)
- Model is calibrated using > ¥2 trillion claims data
- Supports implementation of Japan-specific policy terms and conditions, including:
 - Peril multi-step policies
 - Franchise deductibles
- Model developed in collaboration with local industry partners, and with scientific leaders
- Includes 2016 Industry Exposure Database, with typhoon wind and typhoon flood exposure

As of 2016, around ¥1,400 trillion of insured exposure in Japan faces typhoon risk.

Nationally, 80 percent of average annual typhoon losses are caused by wind, but typhoon inland flooding and typhoon coastal flooding can also have a significant impact on losses, particularly at the local level and in the tail of the loss distribution.

The RMS® Japan Typhoon HD Model uses the latest science to capture risk from typhoon wind, typhoon-driven inland flood, and typhoon-driven coastal flood. The HD methodology combines a simulation timeline of the hazard with ground-up simulation, sampling losses at every impacted location for each event – allowing you to more easily determine what is driving the risk in your portfolio. Improvements to the financial model bring benefits of special interest to the Japanese market, supporting the implementation of policy terms and conditions that are common within the country.

Comprehensive Modeling for Typhoon Perils

The RMS Japan Typhoon HD Model allows for loss differentiation between perils with explicit modeling of typhoon flood, which includes typhoon-driven inland flood and typhoon-driven coastal flood, in addition to typhoon wind modeling.

This enables users to write more profitable business by, for instance, excluding flood from policies in areas where inland and/or coastal flood are a major driver of the risk or, conversely, creating attractive flood policy terms and pricing to attract business in areas where (re)insurers are comfortable with the risk.

A High-Resolution Solution

A high-resolution ~35 meter uniform grid is used for typhoon-driven inland flood and coastal flood modeling, reflecting the high hazard gradient for these perils, which is required for accurate modeling and improved risk selection in primary underwriting.

Typhoon wind hazard in Japan is modeled using a variable resolution grid spanning from 1 km to 10 km in size. Site coefficients at the grid level account for surface roughness, for gust factors and for topography.

SUPPORTED SOLUTIONS

- **RiskModeler**
 - Available as an HD model on RMS(one)®
- **Client support**
 - RMS global client support services provide access to knowledgeable support staff, fulfillment and deployment services, RMS experts, and product and industry training
 - Comprehensive documentation, including model methodology, model validation, and detailed description of the changes in loss with guidance on the drivers of change (from the preceding model), written by model developers

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RMS is the world's leading catastrophe risk modeling company. From earthquakes, hurricanes, and flood to terrorism and infectious diseases, RMS helps financial institutions and public agencies understand, quantify, and manage risk.

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A Model Specific to Japan

During the development of the Japan Typhoon HD Model, RMS received an unprecedented level of market data. Local collaboration partners in the Japanese insurance industry, including Tokio Marine and Sompo Japan, shared high-geographic-resolution claims data for events since 1991, totaling over ¥2 trillion of claims.

Combining this extensive dataset with engineering research into local building codes, regional design and construction practice, and typical building stocks, RMS created improved vulnerability curves and new vulnerability regions for Japan. Design wind speed maps from the Architectural Institute of Japan, and the latest Japanese government data from the Ministry of Land, Infrastructure and Transport were used in vulnerability development. The model contains over 5,000 unique region-dependent vulnerability functions for buildings, contents, and business interruption (BI) coverages.

Losses from complex policy structures and conditions, which are common in Japan, can be modeled using the new HD modeling framework, with step policies and franchise deductibles accurately coded and represented on an account-by-account basis. Policy terms for wind and flood risks can be coded and modeled separately, leading to superior financial model output.

Scientific Innovations in Tropical Cyclone Modeling

A significant proportion of the typhoons that impact Japan have undergone or are undergoing the meteorological process of extra-tropical transitioning. This occurs when typhoons tracking toward the pole interact with mid-latitude weather systems and the jet stream, fundamentally altering the typhoon structure and changing characteristics of the typhoon that influence the severity and distribution of event loss, from both the wind and flood perspectives. The Japan Typhoon HD Model includes the most scientifically advanced extra-tropical transitioning model on the market, in order to accurately model this important phenomenon.

For coastal flooding, RMS uses advanced ocean modeling, physically realistic storm surge and wave modeling, and, as with inland flood, sophisticated defense modeling (including detailed defense information and defense failure mechanisms) and the use of in-house physical inundation modeling.

Redevelopment of the stochastic track model also improves landfall statistics of the stochastic set with regard to the historical record, incorporating RMS research into the physical mechanisms that can support super typhoon landfalls.

These innovations lead to superior modeled representation of typhoons and how they affect portfolios of insured assets, leading in turn to modeled losses that can be used for business decisions with greater confidence.

Find out more

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