



### **What is the difference between a major storm and a catastrophe?**

We often see reports in the media of devastating events, such as the 2011 Christchurch earthquake in New Zealand, the Japanese tsunami, super storm Sandy in the United States or Typhoon Haiyan which affected parts of the Philippines in 2013.

In this context, a catastrophe is defined as a single event, either natural or man-made, that results in damage to a widespread geographic area due to its size or intensity. Examples of catastrophe events include bush or wildfires, earthquakes, tornados, tsunamis, terrorist attacks as well as winter storms and hurricanes. These tragic events can result in both loss of life, significant damage to property and ongoing social and economic impacts.

To protect customers and shareholders during such events, it is a core responsibility of an insurance company to continuously assess and monitor the potential impact of catastrophic events.

# Catastrophe Modelling and Risk Management

A core function of insurance is to provide security and to protect against loss. Nowhere is this more evident than when dealing with natural catastrophes.

At QBE, we recognise that catastrophes invariably have a significant impact on the livelihoods, homes, businesses and ways of life for those in the impact zone. While there are legal and regulatory requirements regarding our responsibilities after a major event, the values of QBE ensure we look first to the human cost and what we are able to do to help people get back on their feet. This human cost is rising as we see an increased incidence of catastrophes globally, just as we are seeing an increase in economic losses related to these events.

According to a World Bank study<sup>1</sup>, economic losses from such disasters have been increasing in the last decade. In the 1980's, losses from catastrophes accounted for approximately \$50 billion a year, increasing to an average of just under \$200 billion a year in the last decade. Correspondingly, there has been an increase in insured financial losses. As emerging economies grow and develop, they will likely contribute to a further expansion of global catastrophe losses.

Additionally, demographic trends in recent years leave a greater proportion of people and assets exposed to natural catastrophes. In 1990, according to the US Census Bureau, 73 million people lived on the shoreline in the United States. The National Oceanic and Atmospheric Administration (NOAA)<sup>2</sup> projects that by 2020

the number will increase to 133 million. This will result in a growing percentage of people and property at risk.

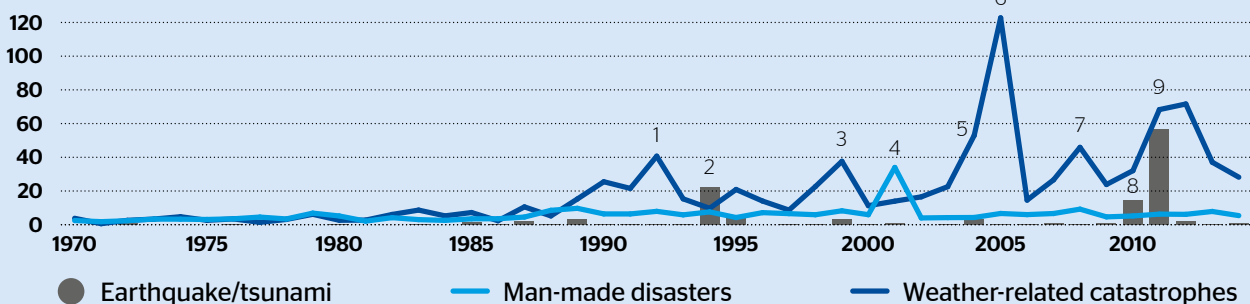
In recent years, there has been some evidence to suggest that the results of global climate change are having a direct impact on the unpredictability and extremity of weather conditions around the world. These factors influence QBE's response to how we plan for, and respond to, catastrophes.

QBE recognises this changing environment and our well-defined risk management strategy is designed to protect shareholders and support its customers through the related challenges.

## How QBE's risk appetite, strategy and modelling work together

The risk management strategy is at the heart of our business, and it shapes our overarching strategy and how we assess the risk we will and will not write. The risk appetite set by the Board and management is the basis upon which we set our risk management framework, including risk governance, reinsurance strategy and the catastrophe modelling across the Group. This framework is also designed to meet the needs and expectations of key stakeholders including regulators, ratings agencies and shareholders.

Insured Catastrophe Losses, 1970–2012 US\$ billion, at 2012 prices



- Source: Swiss Re, Sigma "Natural and Man-made Catastrophes 2012".

1 World Bank, 2013, *Building Resilience: Integrating climate and disaster risk into development. Lessons from World Bank Group experience. The World Bank, Washington DC.*  
2 NOAA, United States Department of Commerce, *National Coastal Population Report: Population Trends from 1970 to 2020, March 2013.*

## QBE staff response to Typhoon Haiyan



Grant of  
**250**  
US\$ thousand

donated to assist with water purification, emergency housing and the rebuilding of core community structures

Over  
**450**  
volunteer hours

committed by our employees

More than  
**500**  
staff donations

matched dollar-for-dollar by the QBE Foundation

Over  
**80**  
boxes

of clothing and toiletries sent and distributed to typhoon victims

Over  
**260**  
families assisted

with distribution of hygiene products and shelter and repair kits

## Catastrophe Modelling

Given a number of challenges presented by relying purely on historical data to predict future losses, QBE utilises sophisticated computer simulations of catastrophes to estimate financial and economic losses, manage catastrophe exposure and assist in making decisions regarding catastrophe risk management and coverage. Furthermore, this catastrophe modelling tool is used by ratings agencies such as Standard & Poor's and A.M. Best to determine their assessment of QBE on a regular basis.

### QBE Catastrophe Modelling Team (CMT)

QBE employs a global team of over 45 highly trained catastrophe risk analysts that form the CMT. CMT resources are deployed in all divisions under the leadership of the Group Chief Reinsurance Officer.

The CMT utilises various software tools and advanced modelling techniques at the business unit and enterprise level to review and manage catastrophe risk, enabling management and underwriters to make business decisions that keep the company within its established risk tolerance. This includes using the latest software to predict potential financial losses to QBE from possible catastrophic events, such as powerful earthquakes and major cyclones and typhoons.

### Models and management judgement

Like any model, these catastrophe models adopted by QBE do have certain limitations. Therefore, QBE constantly exercises management judgement and applies other considerations whenever using models to determine potential impact. Similarly, many catastrophes across the globe are currently not possible to model due to their unexpected nature and unforeseen impacts, such as fires that are secondary to an earthquake. The monitoring of these perils relies on the skills of the CMT supported by other data sources to determine an accurate prediction.

To predict a potential loss, models first capture with specificity the location of each insured asset or property and relevant building characteristics such as age, height, construction type, and occupancy type. Taking into account historical data and scientific estimates of possible event impact, the models then simulate thousands of catastrophe scenarios to estimate potential building damage specific to each event. Catastrophe models then apply policy specific terms such as limit and deductibles to calculate and aggregate claim amounts to reflect QBE's potential exposure to each event. Computer simulations are also used to assess the likely frequency of catastrophe events. The output from catastrophe models is used to structure reinsurance treaties that are tailored to protect QBE's shareholders against high severity catastrophe events that can potentially result in large financial losses for our specific insurance portfolio. Routine catastrophe modelling is a vital component of QBE's Enterprise Risk Management (ERM) framework.

### Making the most of the insights and data

Catastrophe risk analysts across the group participate in the Group Aggregate Management Committee (GAMC), which is responsible for the oversight of catastrophe related data quality, modelling, and analytics. The GAMC coordinates with divisional modelling teams to ensure consistent catastrophe risk assessment throughout the organisation. QBE reviews its risk management process regularly to ensure effectiveness, and introduce or revise processes to reflect significant industry-wide issues or changes in our book of business.

This committee also reviews established risk limits in particular areas and ensures that, in aggregate, all QBE's lines of business have clear limits based on a range of factors including location, potential risk and exposure.

Whilst the team at QBE have adopted these processes when a catastrophe occurs, responding to devastating events at a local community level is also of utmost importance when it comes to delivering our promise to our customers and the communities in which we operate. In 2013, the global QBE team came together following the devastation of Typhoon Haiyan in the Philippines, with hundreds of our staff directly involved in volunteering and fundraising efforts. QBE is proud of the fact that we are able to respond to catastrophes in many different ways, from volunteering and fundraising through to expedited claims processing.



## The claim process following a catastrophe

At QBE, we combine our catastrophe risk analysts' skill with advanced technology to help our customers during the challenging times following an event.

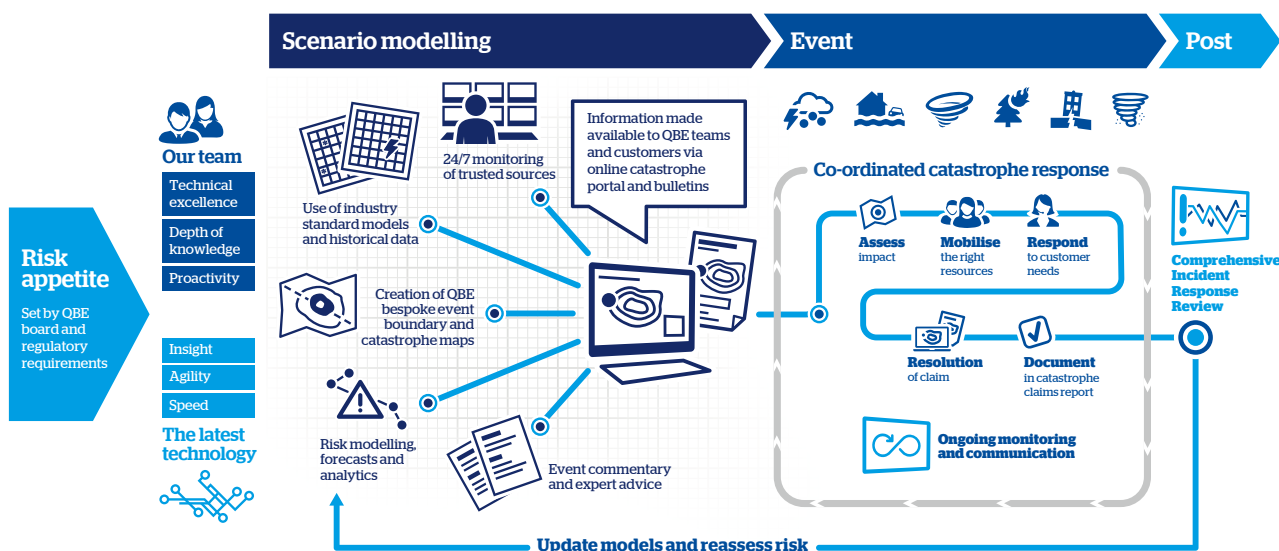
Claims volumes are at their peak in the aftermath of a catastrophe. At QBE we've developed pre- and post-catastrophe processes to ensure that customers receive the response they require, even when we are handling a high number of claims.

We constantly monitor sources including forecasts from respected agencies, damage footprints of hurricanes and other catastrophes through active weather data analysis and remote satellite technology. Catastrophe modellers collaborate with the catastrophe claims team to assess a disaster's magnitude – often even before it strikes. This data informs post-event response planning such as local staffing levels, reporting and turnaround times to ensure customers benefit from superior claims service levels of support after a catastrophe.

Immediately after a catastrophe, QBE's claims response team evaluates damage to our customers and works to resolve claims expediently. The claims and modelling teams work collectively to compare post-event findings against pre-event models and expectations. This collaboration was recently evident during the 2014 Hurricane Arthur event over the US July 4th holiday weekend. Modelling teams provided valuable impact mapping and projection information to the claims team. The claims team were able to use this input to ensure appropriate staffing – even during the holiday weekend – so that post-event claims resolution was timely for customers. The claims' team's post event information from Hurricane Arthur was provided to the modelling team to improve future models and to improve future customer satisfaction.

**Catastrophes test people in a way unmatched by most other challenges of daily life. The disciplined processes adopted by QBE are fundamental in providing support and security to our customers at these trying times and protecting our investors against potential financial impact.**

**QBE is in the business of managing risk; it is at the core of what we do. Continuously assessing and monitoring the unpredictable nature of global catastrophes has led to an established, end-to-end and reliable risk management process and potential financial impact assessment tool that allows us to stay informed and prepared for any major event.**



Does not include non-modelled risks