

GC QuakeCube®

PARAMETRIC EARTHQUAKE COVERAGE INNOVATION

GC QuakeCube combines advances in seismic monitoring and operations research with market-leading access to capital. It provides the holders of risk with a state-of-the-art parametric earthquake risk transfer solution that minimizes basis risk.

CORE BENEFITS



FAST RECOVERIES

Payment of claims on a traditional indemnity insurance policy relies on the assessment of actual damages, a process that may take months or years. This period may be prolonged further if the claims are disputed. The time elapsed between the event and the claims being paid can often be the deciding factor on whether or not a business recovers after an earthquake strikes.



SEEKS TRANSPARENCY

Risk holders and risk-assuming sources of capital demand new, fast and transparent solutions that create a more efficient transfer of risk. They desire to avoid disputes in the recovery process, regardless of whether these arise from misunderstood exclusions in coverage or from differences in views during the claims adjustment process.

Key Features

	Fast – Payments within weeks, not months or years
	Transparent – Coverage is clear and understood by buyer and seller
	Flexible – Recoveries can be applied to holistic event economic losses
	Customizable – Offers a range of coverage triggers that adhere to budgetary constraints
	Broad Application – Available to reinsurers, corporations and public entities globally

GC QuakeCube Determines Payouts in Three Simple Steps



Step #1

Guy Carpenter or the agreed calculation agent extracts the physical event parameters from the reporting agency in accordance with the GC QuakeCube contract.



Step #2

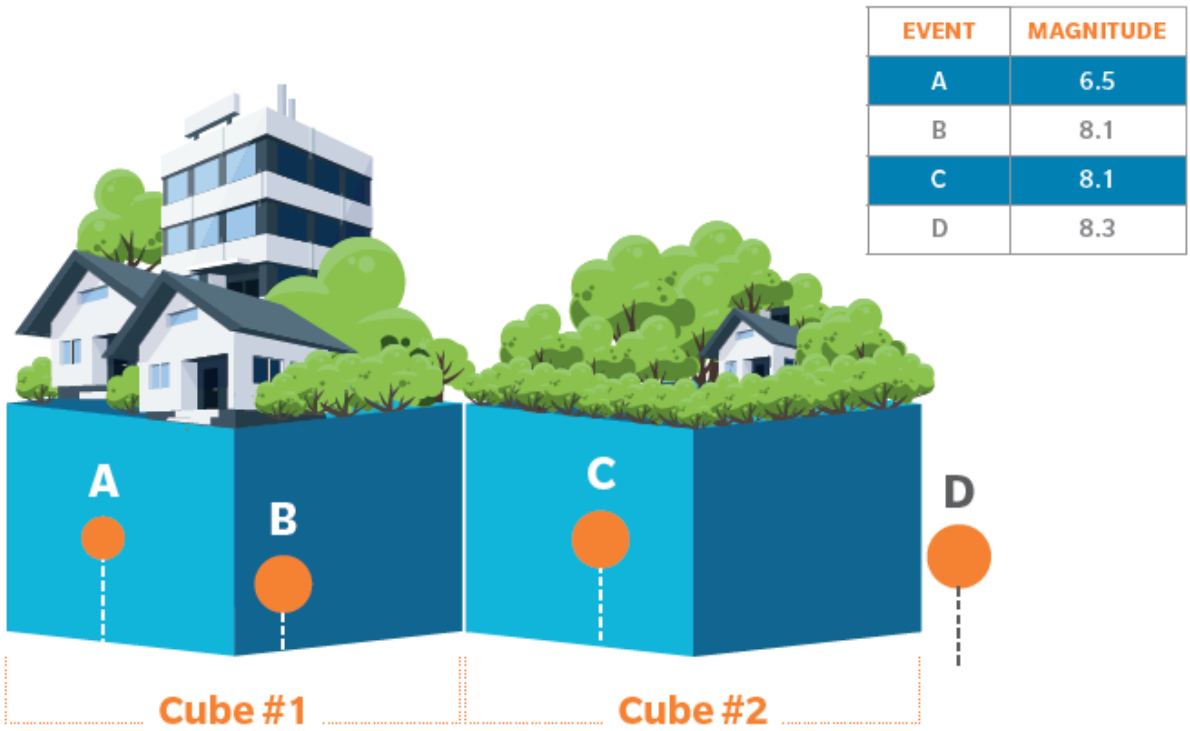
Using the latitude, longitude and depth of the event's focus, we determine whether the earthquake is contained within a cube covered in the transaction.



Step #3

Using the fully transparent payment table included in the contract for the identified cube, it is easy to determine the appropriate payment level given the report event magnitude.

Example



Payment table

MAGNITUDE	PAYMENT
6 ≤ M < 7	25%
7 ≤ M < 8	50%
8 ≤ M	100%

Payment table

MAGNITUDE	PAYMENT
6 ≤ M < 7	0%
7 ≤ M < 8	25%
8 ≤ M	50%

Events A and B fall inside Cube #1, above which significant exposures are concentrated. Per Cube #1’s payment table, Event A triggers a payment of 25% of the coverage limit while Event B, a larger magnitude earthquake, triggers a payment of 100% of the limit.

Event C has the same magnitude as Event B; however, it happens in Cube #2, which is farther away from the large accumulation of exposures. We expect Event C to cause lower losses than Event B. Indeed, Cube #2’s triggering conditions for Event C dictate a lower payment than for Event B being 50% of the coverage limit.

Event D is of a larger magnitude than all the other events; however, it is outside of both cubes, very far from the accumulation of exposure. No payment is triggered under the coverage since the distance from the exposed values is such that no (or minimal) losses are anticipated.

Value



Minimizing Basis Risk

Clients need to be covered for large loss events but they do not need to pay a premium to cover events that do not produce a loss. GC QuakeCube helps clients purchase more efficient parametric coverage using advanced optimization techniques to minimize basis risk.



Reducing Model Risk

Errors in models or in the estimation of event parameters can cause parametric structures to produce volatile recoveries. GC QuakeCube analyzes the expected outcomes of parametric solutions using a number of tests that help our clients understand and reduce the volatility of expected payments.



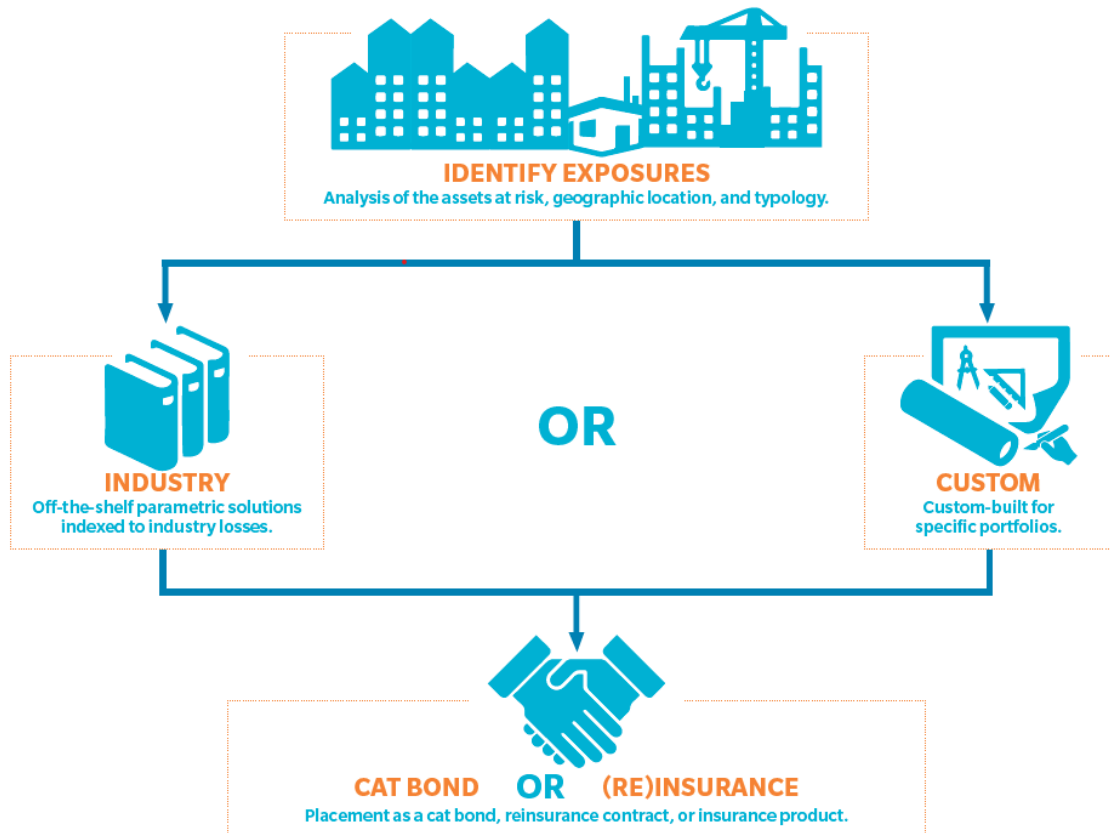
Choice in Model Vendor

GC QuakeCube is model-agnostic and has been designed to work with various model vendors to offer our clients a variety of risk views. Clients can choose from these or devise a parametric blending strategy to hedge model risk.



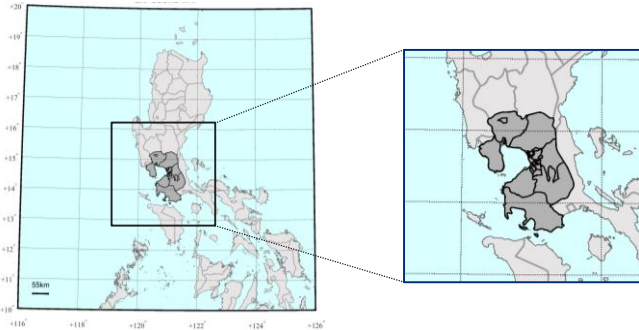
Deployment Versatility

GC QuakeCube can be deployed and underpin coverage in the forms of insurance, reinsurance, capital markets, catastrophe bonds, etc., depending on the needs of the specific client. The flexibility of structuring and supporting risk capital allows the coverage to be placed as efficiently as possible.



MANILA (PHILIPPINES) USECASE: Built to Minimize Basis Risk

GC QuakeCube solutions are optimized so that events responsible for potentially larger Average Annual Losses (AAL) have a higher probability of causing a payout. In this manner, GC QuakeCube also minimizes the coverage of events that cause little impact to the portfolio’s AAL. The result is a parametric cover that optimizes the premium paid versus coverage.

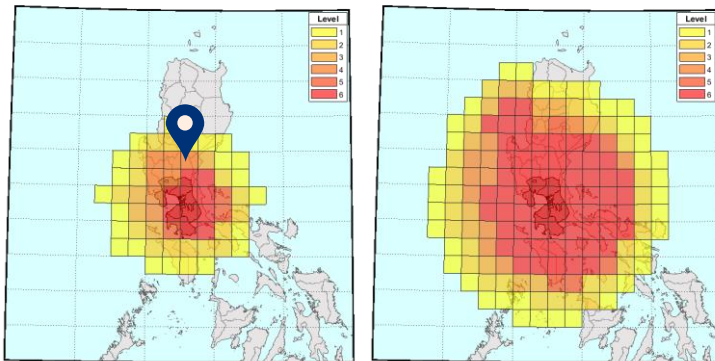


Exposures

The GC QuakeCube solution for Manila considers the industry exposure in 8 CRESTA zones around the city. The parametric cover is calibrated to respond to events that cause significant loss in this area, with progressively larger payouts for events of increasing loss potential.

Payout By Magnitude

Coverage increases for increasing magnitudes.

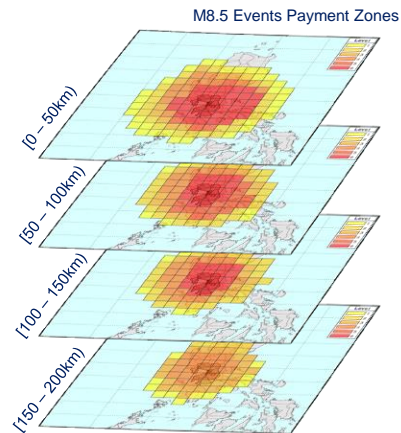


M7.7 Events Payment Zones
Depth Layer [0 – 50km]

M9.0 Events Payment Zones
Depth Layer [0 – 50km]

Payout By Depth

Deeper events typically cause less damage. GC QuakeCube optimizes the payouts so that the premium is focused on covering shallower events with more loss potential.



M7.7 1990 Luzon Earthquake

Occurred on July 16, 1990 at 25.1 km depth resulting in 1,600+ casualties, 3,000+ injured, and severe damage around epicenter and near Manila. The magnitude and location of the event correspond to a significant 63% limit payout of this illustrative structure.

COVER TYPE: Parametric earthquake

PERILS COVERED: Shaking, tsunami, landslides or liquefaction

COVERED LOSSES: Any loss (including property) & time element

CLAIM PERIOD: Pays within 30 business days; one year for justification loss

LIMITS: Typically up to \$200 million via (re)insurance, higher limits via ILS

MARKETS: Global reinsurance companies & capital markets funds

MECHANISM: High-res cat-on-a-grid

GEOGRAPHIC AVAILABILITY: Global

REPORTING AGENCY: US Geological Survey (USGS)

REPORTING PARAMETERS: Epicenter, focal depth, and magnitude

CUSTOMIZATION: Any portfolio

Contact

If you are interested in learning more about GC QuakeCube or would like to organize a live demonstration of the platform, please contact any of the following specialists:

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About Guy Carpenter

Guy Carpenter & Company, LLC is a leading global risk and reinsurance specialist with more than 3,200 professionals in over 60 offices around the world. Guy Carpenter delivers a powerful combination of broking expertise, trusted strategic advisory services and industry-leading analytics to help clients adapt to emerging opportunities and achieve profitable growth. Guy Carpenter is a business of Marsh McLennan (NYSE: MMC), the world's leading professional services firm in the areas of risk, strategy and people. The company's 76,000 colleagues advise clients in over 130 countries. With annual revenue of \$17 billion, Marsh McLennan helps clients navigate an increasingly dynamic and complex environment through four market-leading businesses including Marsh, Mercer and Oliver Wyman. For more information, visit www.guycarp.com and follow Guy Carpenter on LinkedIn and Twitter @GuyCarpenter.

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