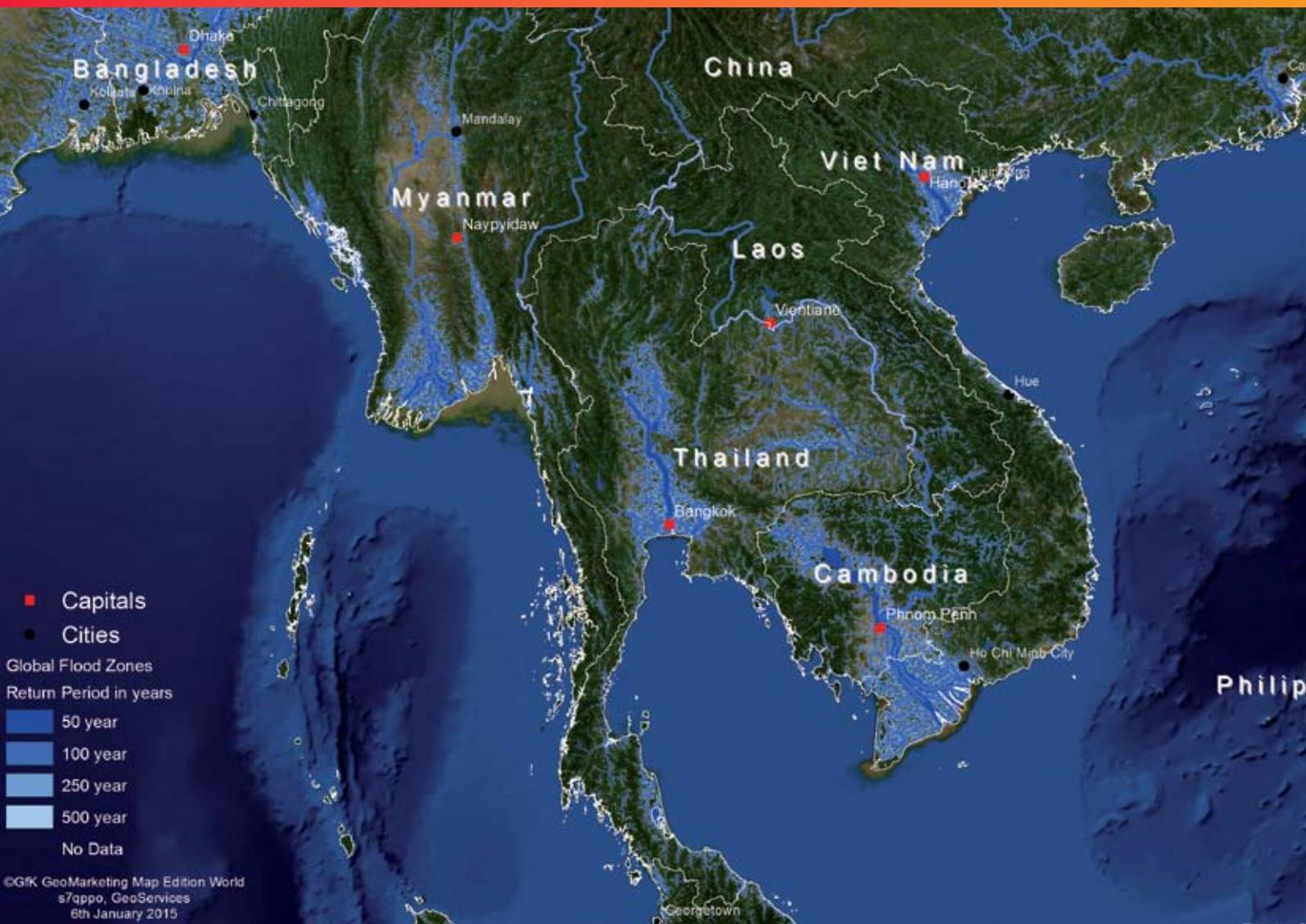


Risky Cities:

Bangkok

The impact of extreme weather is set to become increasingly painful and expensive. This is because the world population and asset concentrations are increasing, especially in the mushrooming cities of the developing world, many of which either lie on the coast or on major waterways close to it. Bangkok – which the government wants to see become “Asia’s capital” by 2032 – is a case in point.* Using Swiss Re’s risk models and detailed hazard data available in CatNet®, we have analysed the potential impact of flood risk on Bangkok and its surrounding region. This analysis is part of Swiss Re’s report: “Mind the Risk – a global ranking of cities under threat from natural disasters”, which compares the human and economic exposure of 616 cities around the world.

*20-Year Development Plan for Bangkok Metropolis, WWW.BANGKOK 2032.COM



Thailand's flood challenge and where the insurance industry can help

Thailand's tropical location and the influence of monsoon rains as well as local topography make it vulnerable to floods. What happened in 2011 is a case in point. The Asian monsoon season began with record downpours in March and April. By May, this early onset of heavy rain had already saturated the soil and filled reservoirs to the brim. Rivers in the country's Chao Phraya basin began swelling dangerously. High precipitation rates then continued throughout the entire rainy season. By the end of October, Central and Northern Thailand had received considerably more rainfall than normal for the time of year. The Chao Phraya River and its tributaries finally burst their banks, inundating 61 of Thailand's 77 provinces, including the northern outskirts of Bangkok.

Economic dislocation

The devastating flood not only caused widespread casualties and serious financial hardship for thousands of individuals but also resulted in economic losses of USD 48 billion. Insured losses, on the other hand, only amounted to USD 16 billion.¹

The inundation also had a severe impact on both the supply and demand side of Thailand's economy and public finances. Private consumption, for example, was negatively impacted by an increase in unemployment, and Thailand's GDP in late 2011 contracted sharply as a result.

Moreover the huge disparity between economic and insured losses resulted in an additional burden on the public purse since it now had to absorb the lion's share of the losses. And this was on top of the additional public spending now necessary to strengthen water management and flood risk prevention measures.²

Consequences beyond Thailand

The 2011 flood also had serious, far-reaching consequences beyond Thailand. Apart from the damage to its national economy, the Chao Phraya floods also triggered a reaction across the global production chain. This was a consequence of the large number of foreign manufacturing complexes built in the Chao Phraya flood plain producing goods susceptible to water damage, such as electronic items. It should also be noted that approximately 20 million people live in the Chao Phraya River basin, almost one-third of the country's total population.

So floods can cause exceptionally high insurance losses as claims are not only incurred from physical damage on the ground but also from lower productivity and disruptions to international operations and supply chains.

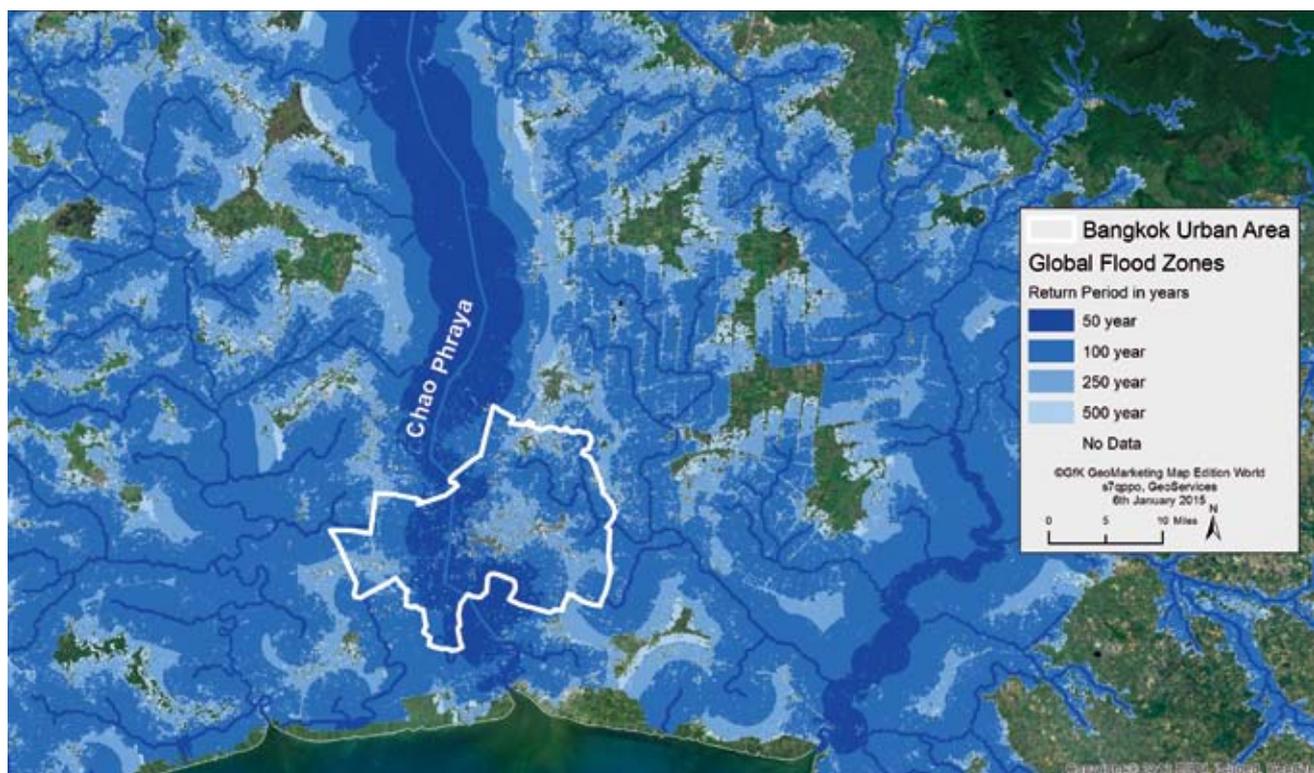
Helping governments better prepare for risk

The insurance industry has much to offer to exposed stakeholders - be they individuals, corporates or government. This help can come in the form of sharing its risk management expertise and financial capacity to narrow the gap between economic and insured losses should a similar event occur in the future. Consequently, Swiss Re strongly supports ongoing dialogue between society, insurers and the public sector to establish public-private partnerships designed to further reduce the risk and to help governments better prepare for the residual risk.

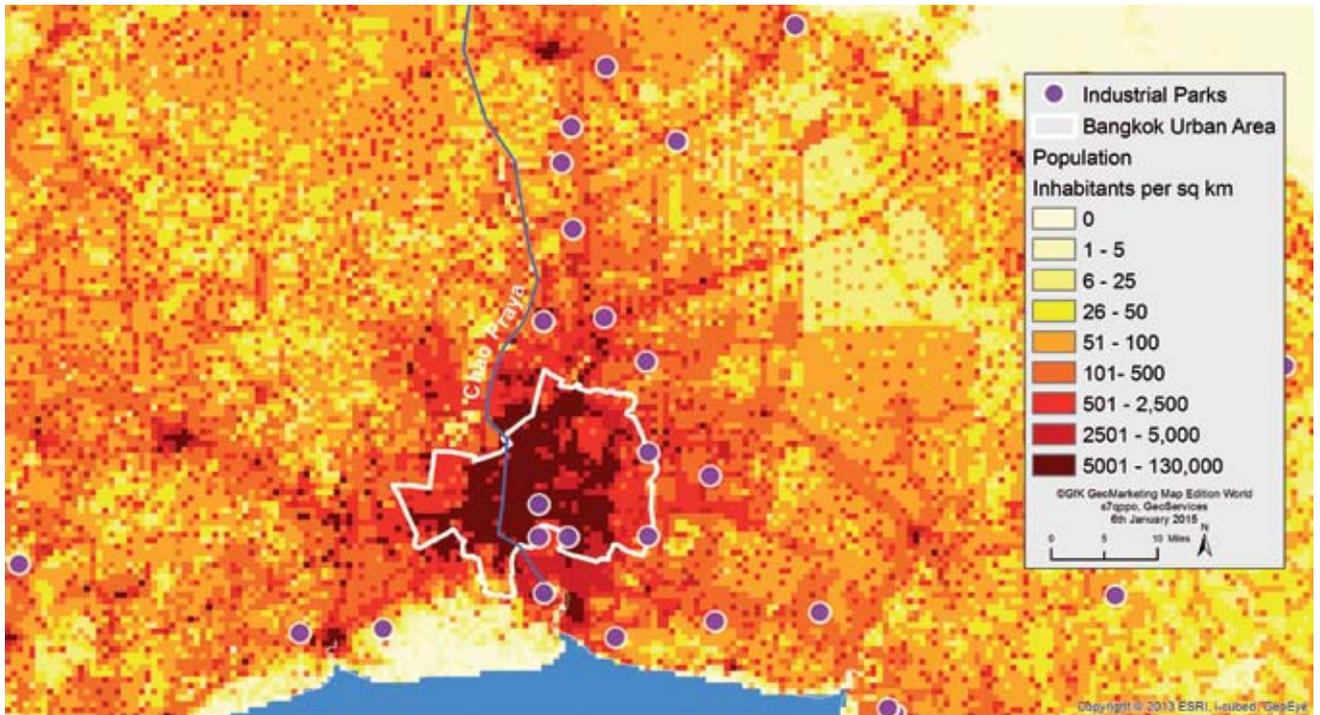
This dialogue, combined with better hazard information and continual product innovation, will help identify effective flood protection measures for exposed areas, both industrial and residential. In some cases, strengthening regional rather than local flood protection systems can be more efficient and should be addressed with the responsible authorities. Regional measures of this nature would be especially applicable to Thailand given Bangkok's exposed location at the mouth of Chao Phraya River.

¹Swiss Re, *sigma* database

²In response to the flood event, Thailand's government launched a multi-billion dollar flood rehabilitation plan



CatNet® map showing river flood risk in the Bangkok area

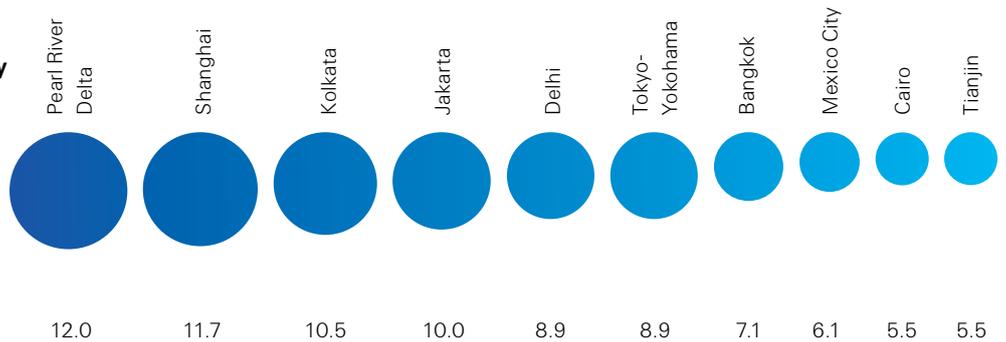
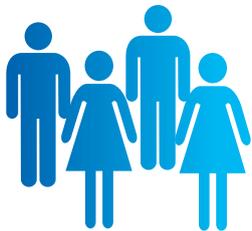


CatNet® map showing population density and industrial parks in the Bangkok area

How does Bangkok compare internationally?

Human impact

Millions of people potentially affected by river floods*

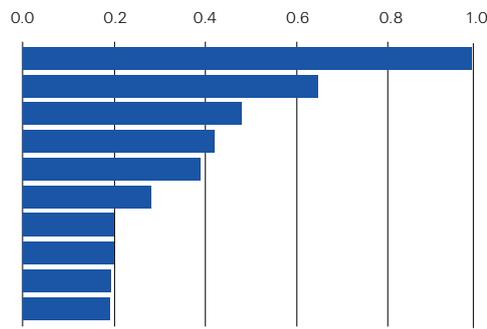


Economic impact

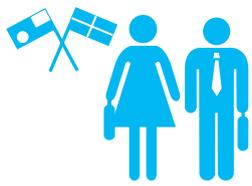
Value of working days lost* in absolute terms



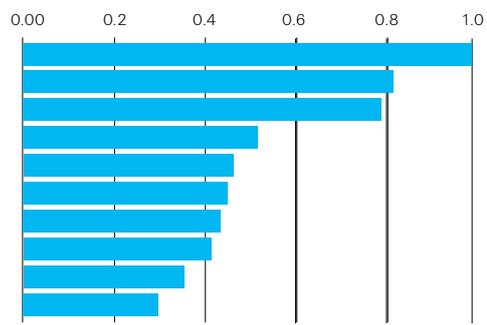
(global index 0.0–1.0)



Value of working days lost* relative to national economy



(global index 0.0–1.0)



*Global risk from river floods

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Building resilient communities

An important part of resilience is how well urban and regional communities can bounce back from the financial consequences of a disaster such as severe flooding, and how rapidly they can mobilize the resources necessary to expedite disaster relief and economic recovery.

Swiss Re's capability and solutions

To avoid increasing public debt, raising taxes or diverting critical assets when communities and their residents are hurting most, Swiss Re offers risk transfer solutions that can assist with covering the financial burden public authorities face. Its risk management experts can also help public authorities prepare for natural disasters more comprehensively than perhaps they have done in the past.

Indemnity insurance

can cover damages or losses caused by natural disasters which can range from seismic activity and flood to wind storms. Indemnity insurance provides protection against damage to property or income loss due to interruption to business or services. It is an insurance policy which pays out based on the actual economic losses incurred, up to the limit and duration specified in the insurance contract.

Parametric insurance

can cover earthquakes for example. Unlike traditional insurance, parametric instruments use measured or modelled data to determine payouts. The payout model aims to closely mirror the actual damage on the ground and is usually based on the physical parameters of a catastrophic event or an index of such parameters, such as the location of an earthquake magnitude. Parametric insurance enables a much more rapid payment than indemnity insurance because it requires no loss adjustments to assess the actual damage after an event.

This is critical for communities that need budgetary liquidity following a catastrophe. They receive rapid cash to help with emergency response, debris removal or general clean-up expenses.

Weather insurance

is an example of a parametric insurance cover which protects buyers against the impact of adverse weather on their business and property. The underlying index for such a product could be meteorological data such as precipitation or extreme temperature.

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The value of CatNet® www.swissre.com/catnet

The CatNet® functions and data facilitate a professional overview and assessment of natural hazard exposure for any location worldwide.

This makes CatNet® a valuable tool in preparing local, regional and cross-regional risk profiles.

Concretely, it

- provides swift hazard checks for regions you are unfamiliar with
- generates customised maps combined with satellite images
- enables you to import your location data to illustrate risk exposures combined with natural hazard data
- provides country-specific insurance conditions, claims experience and natural disaster loss dimensions