AON

2021 Weather, Climate and Catastrophe Report

Asia-Pacific Regional Insights

Organisations, governments and communities are beginning to realise that our interconnected world is becoming more directly — and indirectly — affected by the environment around us.

Examining global natural hazards helps quantify and qualify how climate change, socioeconomics, and other emerging issues are driving new types of risk. This data can help business leaders assess how their organisations can increase resilience amid an increasingly volatile climate.

Whilst the cost of covering climate-related risks is rising, leading to complex claims and an increase in uninsurable risks, there are strategies and partnerships available to help mitigate these challenges.

Major Natural Disaster Events and Loss Trends In Asia-Pacific[1]

After three consecutive years (2018-2020) of economic losses topping USD $100 bn, the toll in Asia-Pacific (APAC) dipped to USD $78 bn in 2021. This was 31 per cent below the 2000-2020 average (USD $113 bn) on an inflation-adjusted basis.

The below average losses were mainly due to the relatively quiet tropical cyclone season in the western Pacific Ocean and slightly lower flood-related costs, however flood events did account for more than 55 per cent of the economic losses in 2021.

The absence of El Niño conditions helped suppress losses from wildfire and drought. Insurers in APAC recorded aggregated losses of USD $9.4 bn, which was 31 per cent below the 21st Century average and 57 per cent below the decadal average.

The protection gap remained a challenging issue in APAC as insurance covered just 12 per cent of the economic losses in the region.

After three consecutive years (2018-2020) of economic losses topping USD $100 bn, the toll in Asia-Pacific (APAC) dipped to USD $78 bn in 2021. This was 31 per cent below the 2000-2020 average (USD $113 bn) on an inflation-adjusted basis.

The below average losses were mainly due to the relatively quiet tropical cyclone season in the western Pacific Ocean and slightly lower flood-related costs, however flood events did account for more than 55 per cent of the economic losses in 2021.

The absence of El Niño conditions helped suppress losses from wildfire and drought. Insurers in APAC recorded aggregated losses of USD $9.4 bn, which was 31 per cent below the 21st Century average and 57 per cent below the decadal average.

The protection gap remained a challenging issue in APAC as insurance covered just 12 per cent of the economic losses in the region.

> Clearly there is both a protection and innovation gap when it comes to climate risk. As catastrophic events increase in severity, the way that we assess and ultimately prepare for these risks cannot depend solely on historical data. We need to look to artificial intelligence and predictive models that are constantly learning and evolving to map the volatility of a changing climate and its interaction with a complex and everchanging urban environment. With scalable solutions, organisations can make better decisions that make them more resilient as they continue to face interconnected and increasingly volatile risks.
>
> **Owen Belman, Head of Asia**

1. Aon's 2021 Weather, Climate and Catastrophe Insights report

Regional Overviews

Australia

In Australia, 2021 delivered six catastrophe events covering a bushfire, two floods, a severe thunderstorm, a tropical cyclone and an earthquake.[2] The activity through 2021 clearly highlights the variety of natural hazards that Australia is exposed to with none of this activity out of the ordinary.

The aggregated insurance loss across 2021 (AUD $2.16b) was slightly above the long-term average of AUD $1.84b (if looking back to 1967). Referring to the last decade, 2021 was slightly below the average of AUD $2.31b.

However, it is concerning to note that last year, the protection gap – which is the portion of economic losses that are not covered by insurance – was 57 per cent, rising from around 30 per cent in 2020. In Australia alone, natural catastrophes have averaged nearly AUD $2.694 billion in annual insured losses dating to 2010.

One of the more widespread and significant declared catastrophe events was the March 2021 floods. On 18 March 2021, a low-pressure trough formed along the eastern seaboard of Australia, causing intense and prolonged rainfall and flooding across south-east QLD, coastal and inland NSW and parts of Victoria. The trough was extensive, covering 1200 km of north-south length. This type of weather pattern is not uncommon for the time of year, but there were two main factors that contributed to the heightened flood risk. The first was that this event occurred at the end of a wetter-than-usual summer period driven in part by La Niña. The second was the stationarity of this event, with heavy rain persisting for four to five days.

The highest rain volumes were experienced on the NSW mid-north coast (~ 500 years return period) and north-west (~ 300 years return period) regions.[3] The largest seven-day rain total was at Bellwood, Nambucca Heads, where over a metre of rain was recorded, exceeding the 2000-year return period level.

Flood levels recorded at river gauges did not, in general, equate to the comparably extreme rainfall. Return period flood depths at Taree, on the mid-north coast, were around the 100-year level, whereas every other flood affected area was below the 50-year level, and in most cases the 10 to 20-year level. As of February 2022, aggregate insured loss from this event sits at AUD $0.6b.[4]

Local climate projections generally highlight an increased intensity of extreme rainfall in future decades, with significant regional variability.[5] Translating these rainfall projections into flooding impacts remains highly uncertain as many other variables that control flood risk also need careful consideration. Natural variability in the climate system is expected to control future insured losses from weather events over the next decade.

Projected changes to the frequency of extreme weather events that cause extreme rainfall (and subsequent flooding) and changes in catchment infiltration capacity (urbanisation and antecedent conditions) need careful consideration when forming a view on any future change in flooding impacts.

2. ICA's Insurance Catastrophe Resilience Report: 2020-21
3. Return period estimates from the Australian Rainfall and Runoff, ARR, IFD data, 2016
4. ICA's Insurance Catastrophe Resilience Report: 2020-21
5. www.csiro.au/en/research/natural-disasters/floods/Causes-and-impacts

New Zealand[6]

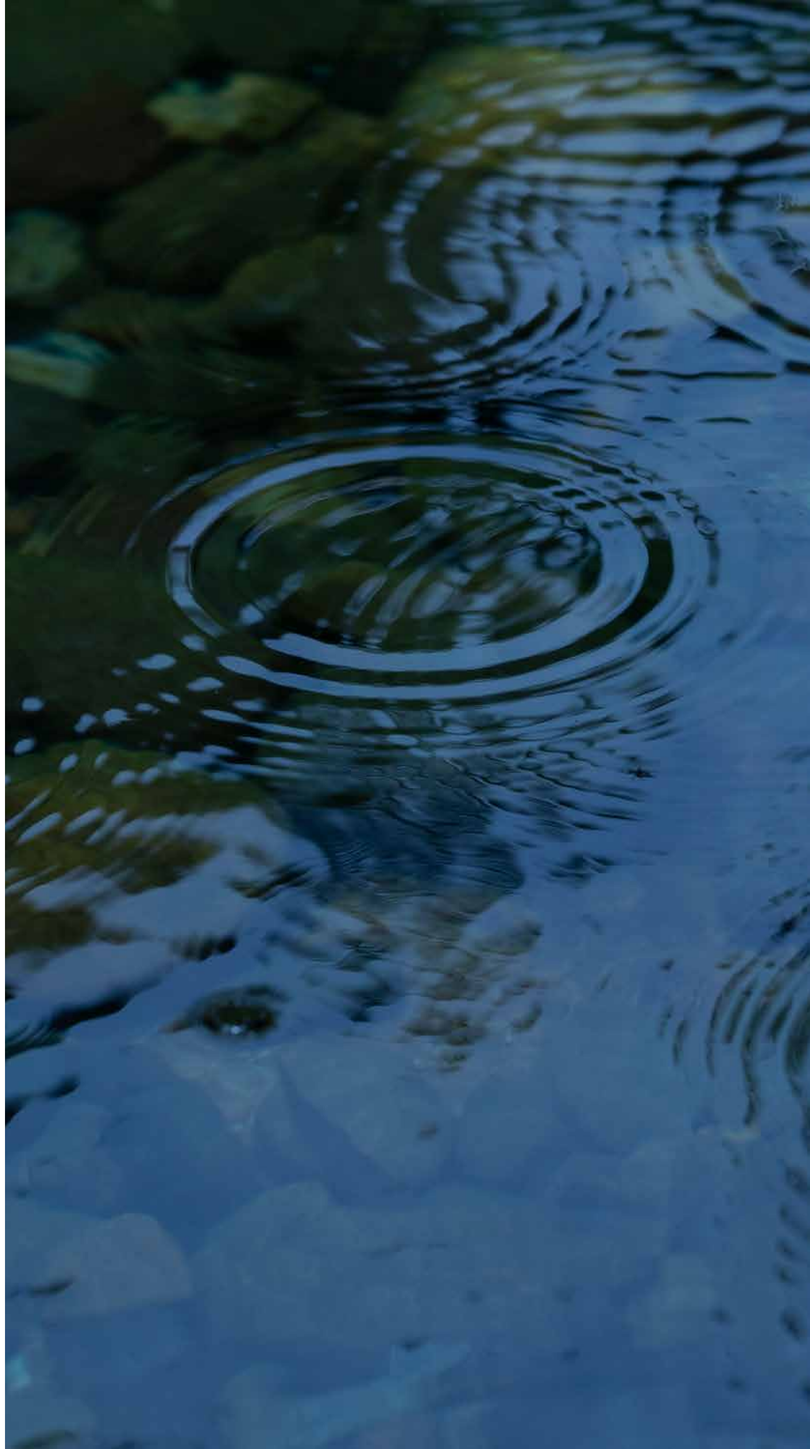
In New Zealand, 2021 delivered 10 catastrophe events and an aggregate insured loss of NZD $322.5m. his aggregate loss was well above the long-term average for New Zealand (excluding earthquake) of NZD $70m. Looking back over the last decade, 2021 was well above the average of NZD $180m.

In fact, 2021 was the costliest insured loss year for New Zealand on record since 1968 (for weather perils). Five out of the top six insured loss years (since 1968) have occurred in the last five years with the great majority coming from storms and related flooding.

The most significant event of 2021 was the west coast floods from July. The upper South Island was hit with persistent, heavy rainfall from a strong cold front lying across the region from 16-18 July 2021. Rainfall totals were over 300mm in 24 hours at many recording stations across the region. One station in the Hokitika catchment recorded 622 mm in 42 hours. This reading at Cropp Waterfall is equivalent to over half of Auckland's annual rainfall total.

The persistent heavy rainfall caused widespread flooding across the Buller region including the town of Westport where over 600 homes were evacuated. Significant residential property damage across Westport was observed. The Buller River at Longford reached 1200 cumecs on 17 July 2021. This flow into Westport was approximately equivalent to the 50-year return period (two per cent annual probability).

As with Australia, local climate projections highlight an increased intensity of extreme rainfall in future decades, with significant regional variability. Translating these rainfall projections into flooding impacts remains a highly uncertain exercise. Natural variability in the climate system is expected to control future insured losses from weather events over the next decade.



6. www.icnz.org.nz/natural-disasters/cost-of-natural-disasters

Asia[7]

Many Asian communities are exposed to increasingly volatile weather conditions that are in part enhanced by the growing effects of climate change. In 2021 this includes record-setting rainfall and flooding, intense landfalling tropical cyclones, droughts and winter storms. As ongoing urbanisation brings population concentration and asset accumulations, the costliness and severity of impacts of natural disasters in the region are heightened.

In Taiwan, the national temperature record reached 40.6°C (105.1°F) on 11 August 2021.

In the Philippines Super Typhoon Rai marked the deadliest tropic cyclone of 2021. Its landfall in late December resulted in 409 fatalities and other casualty in Vietnam. Rai became the third-costliest typhoon on record in the Philippines.

In India, seasonal flooding resulted in 1,282 deaths fatalities and Cyclone Yaas became the costliest Asia tropical cyclone in Asia at almost USD $3b in economic loss.

Malaysia encountered its costliest and most extensive flood event on record in December 2021 with total economic losses incurred topping USD $2b.

7. Aon's 2021 Weather, Climate and Catastrophe Insights report

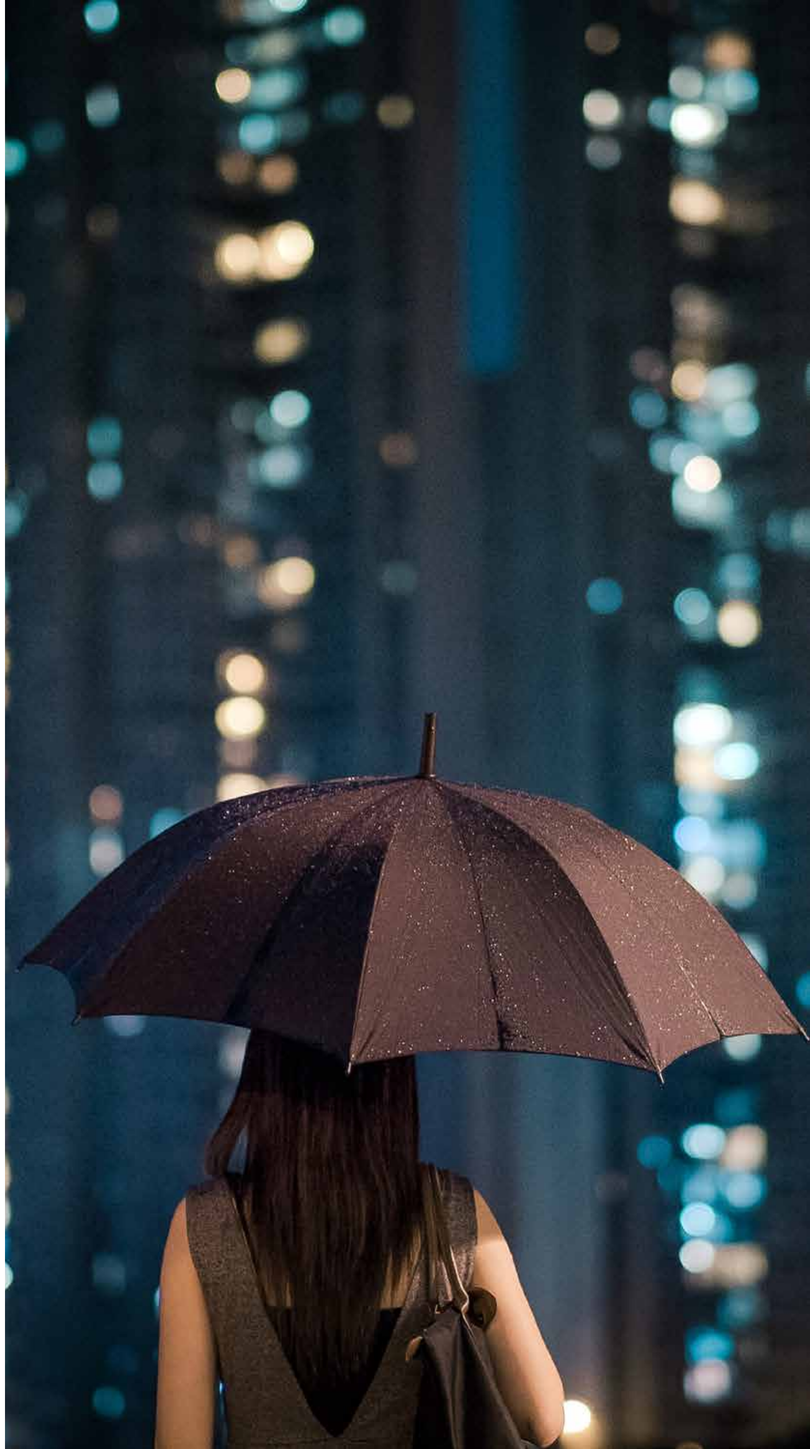
China[8]

China has recorded another above average year of catastrophe losses in 2021. While typhoon activities were relatively quiet over the year, and no major earthquakes occurred in populated regions, flash flooding in central China's Henan province served as a reminder of the complexity and variety of hazards the country is exposed to.

Several days of incessant rainfall, aided by the seasonal Meiyu monsoon front, generated historic flooding and flash-flooding particularly in Henan province. The persistent rains were enhanced by abundant moisture pushed inland around a sub-tropical high-pressure ridge, and topographically influenced by the Taihang and Funiu mountains. The pattern was also tapping into moisture from Typhoon Cempaka, which eventually came ashore in Guangdong Province, and the outer fringes of Typhoon In-fa. This resulted in an exceptionally moist environment and a highly wet atmosphere that precipitated to the surface.

As a result, from 17-23 July, Henan province experienced a rare continuous heavy rainfall across all prefecture cities. Cities in the central northern region including Zhengzhou, Jiaozuo, Xinxiang, Luoyang, Pingdingshan, Jiyuan, Anyang, Hebi and Xuchang experienced heavy rainstorm. The province's average daily rainfall was 220.3mm. Zhengzhou was the worst affected region of the torrential rainfall and registered the heaviest rainfall between 19-20 July.

The insurance bill for the flash flooding totaled USD $1.9 bn, which is the highest in the nation's history. The death toll and economic losses are also amongst the highest in the recent decade.



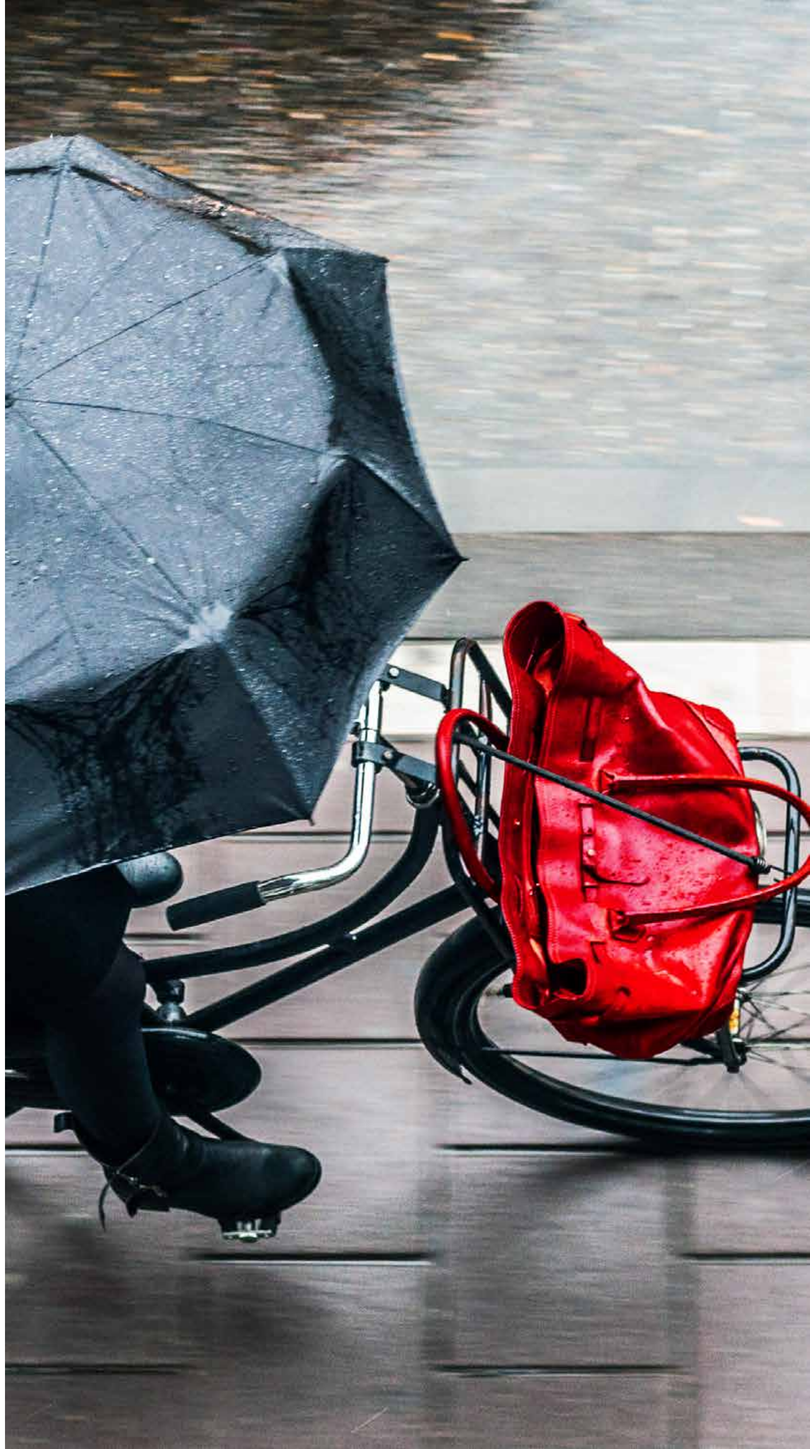
8. Aon's 2021 Weather, Climate and Catastrophe Insights report

Japan[9]

In Japan, the most damaging catastrophes in 2021 were attributed to the earthquake peril. The combined economic loss was almost USD $9 billion, mainly from the Fukushima and Miyagi events. The Fukushima event in particular was significant, as the magnitude-7.1 tremor caused insured losses approaching USD $2.5 billion.

Climatological data points towards a strong component of climate variability in the 2018/19 typhoon seasons in Japan (similar to 2004) and the possibility of this climate oscillation to remain the same or even increase in the future depending on the global and/or regional climate change impact.

Volatility of CAT losses could increase in the future, especially if potential changes in other perils like rain, draught, snow and other atmospheric related phenomena due to climate change are considered.



9. Aon's 2021 Weather, Climate and Catastrophe Insights report

Quantification and Catastrophe Modelling

The development of frameworks to achieve the most comprehensive quantification of the changes in all atmospheric risks due to climate change possible, will provide insurers with a more informed degree of risk management as well as an established and sound forum for discussion, with all stakeholders to achieve a sustainable market in the future.

It is widely accepted that catastrophe models are the best available tools to tackle quantification issues. Disciplines like model development, model evaluation, calibration and validation are becoming more and more relevant as modelling tools increase their complexity, in order to reduce the uncertainty around climate change impact.

The world is becoming more volatile and uncertain, leading investors and regulators towards increasing their requirements for more disclosure of the climate-related impacts on businesses.

The (re)insurance sector, with its deep knowledge of catastrophe risk, has the possibility of tackling this challenging topic from an angle of growth and opportunity, increasing transparency with customers and developing products on the primary side to leverage new solutions to hedge some of that risk.

> “With one of the lowest levels of insurance penetration and rapidly evolving urbanised centres, addressing vulnerabilities related to climate risk is not only critical but also presents many challenges. We can no longer build or plan to meet the climate of yesterday. With physical damage loss costs rising, this is also leading to lingering global disruptions to supply chains and various humanitarian and other asset-related services. There is an ongoing need for public and private entities to collaborate and help bridge the gap of insurance protection. The path forward for organisations and governments must include sustainability and mitigation efforts to navigate and minimise risk as new forms of disaster-related volatility emerge.
>
> **Brad Weir, Head of Analytics, Asia**

The Importance of Resilience

Insured losses caused by some natural hazards can be reduced through improving the resilience of the built environment. As only a proportion of the built environment is exposed to bushfires, floods or typhoons and cyclones, this ‘at-risk’ proportion can be focused on for improvement.

Cost-effective resilience measures for other severe weather perils such as thunderstorms (hail) and common synoptic storms (low pressure systems) that can impact anywhere remain a challenge.

The insurance industry is well placed to promote education and awareness across the community of extreme weather risk, associated costs and measures to improve resilience.

> For more insights, Aon’s 2021 Weather, Climate and Catastrophe Insight report, explores the increasing frequency and severity of disruptive natural disasters and how their resulting economic losses are protected on a global scale.

Contact Us

Peter Cheesman CCRMP
Head of APAC Analytics

+61 2 9650 0462
peter.cheesman@aon.com

Yifan Fu FCAS FIAA CCRMP
Head of Analytics, Greater China

+852 6532 7923
yifan.fu@aon.com

Oriol Gaspa Rebull
Head of Analytics, Japan

+44 77 1490 3984
oriol.gaspa@aon.com

Brad Weir
Head of Analytics, Asia
Reinsurance Solutions

+65 8181 7716
brad.weir@aon.com