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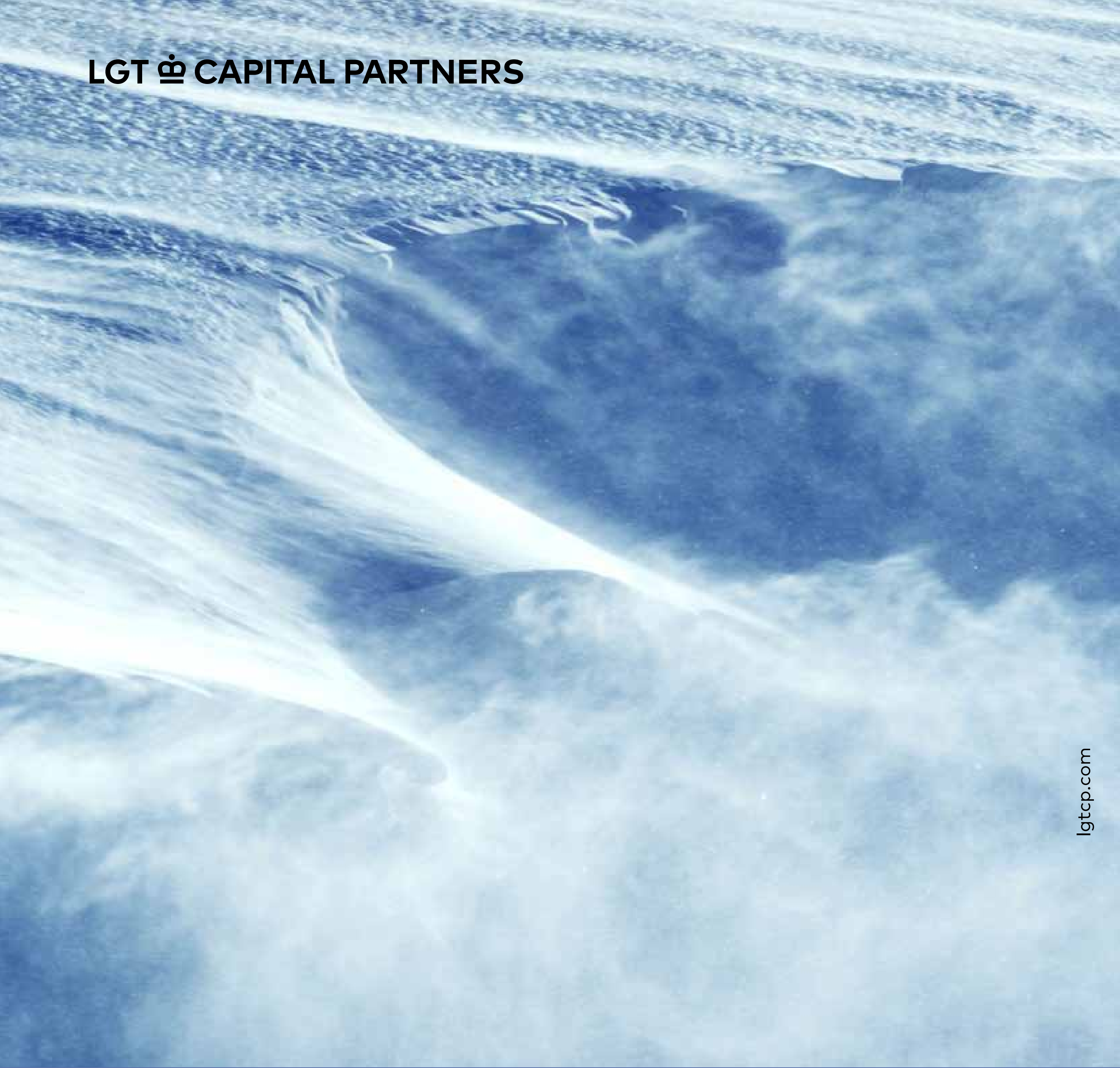

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Investing in insurance-linked strategies in a changing climate

Q2 2024

Executive Summary

Investors in insurance-linked strategies (ILS) benefited from very attractive return momentum in 2023. The key driver of the strong returns for ILS in 2023 was the much higher premium environment, coupled with a revised portfolio allocation strategy that mitigated loss impacts to a significant extent. ILS managers adjusted their strategies by reducing frequency covers and by focusing on risk-remote transactions, mainly concentrating on single, extreme catastrophe events. These actions ultimately reinforced the return characteristics of this asset class.

For primary insurance companies, however, 2023 was far from a good year. Based on a report by Gallagher Re, a leading reinsurance broker, the private insurance industry faced a total tally of more than USD 130 billion in catastrophe losses in 2023, making it one of the costliest years in recent history. This high loss burden was not necessarily driven by individual, extreme catastrophe events – such as a massive earthquake or hurricane. Instead, the losses derived mainly from multiple series of mid-sized events. For instance, 2023 was the most active year on record for US severe convective storms, with USD 60 billion in loss contributions from this peril alone. Hundreds of tornadoes affected numerous towns across the US Midwest throughout the year, leading to substantial losses for local insurance carriers. Aside from these tornadoes, the most notable events in 2023 were the earthquake in Turkey in February, the wildfires in Maui in Hawaii over the summer, the sequence of bad weather events in Europe, including massive floods in Italy and hurricane-strength windstorms in Greece and Spain, and finally Hurricane Idalia, which severely affected northern Florida. This intense series of events has put ILS managers' revised portfolio strategies to the test – and as we know today, the adjusted allocation strategies resulted in the attractive returns for 2023, despite increased catastrophe event activity.

Developments in recent years have made it increasingly apparent that climate change is now a serious concern for the insurance sector as well as for investors in the ILS asset class. In this white paper, we outline the potential effects of climate change on the insurance industry's key perils and regions. We also demonstrate how an allocation to ILS can contribute towards generating an attractive return – even in a state of increased event activity – by actively managing frequency covers, reducing investments in low-attaching transactions and focusing on single, extreme events where the impacts from climate change appear to still be limited. In short, we aim to outline how best to invest in ILS against the backdrop of climate change.

Introduction

The total economic burden of natural perils on society exceeded USD 350 billion in 2023, with the (re-)insurance industry and ILS market covering an estimated 35% of the total costs. Global property insured losses have now exceeded the USD 100 billion mark for four years in succession as well as in six of the last seven years. As shown in Figure 1, developments in 2023 also confirmed a trend that has become apparent over the past decade, i.e. a substantial increase in the number of losses from so-called "frequency" perils, which include convective storms, wildfires and floods.

These perils are characterized by a higher frequency and lower severity than peak natural perils like earthquakes, tropical cyclones (hurricanes and typhoons) and extratropical cyclones. Figure 2 shows that despite being generally less destructive, "non-peak" frequency perils have become the major driver of aggregate annual losses for the insurance industry on a global scale. Even the ILS industry, which has traditionally provided protection against peak perils, has in recent years experienced significant and unexpected losses from these secondary frequency perils.

Annual frequencies of weather-related insured loss events

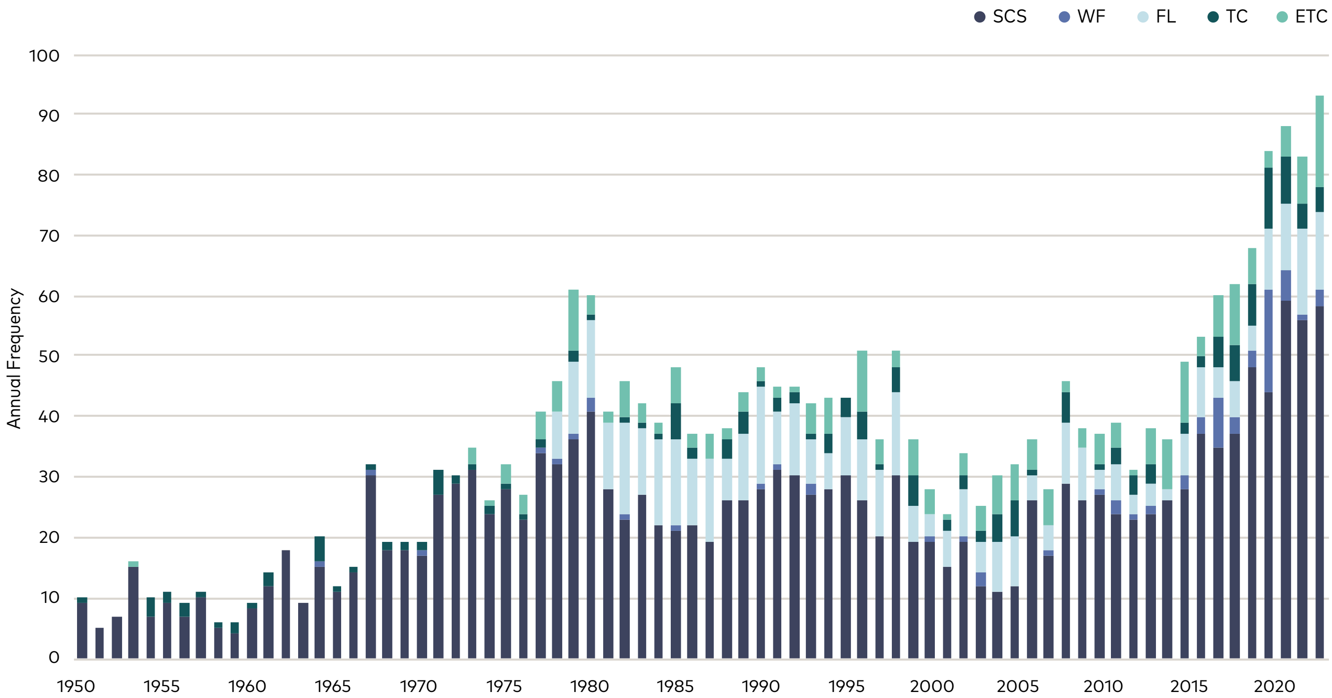


Fig. 1: Annual number of globally recorded insured loss events caused by severe convective storms (SCS), wildfires (WF), floods (FL), tropical cyclones (TC), and extratropical cyclones (ETC) since 1950. The data for the United States was obtained from Property Claims Services (from 1950 to 2023), while the data for Europe, Japan, Canda, and Australia was obtained from Perils (from 1990 to 2023).

Global warming is frequently portrayed in the media as the main driver of the increasing number of natural catastrophes around the globe today. A warming atmosphere is, however, only one side of a multi-faceted reality: new properties are frequently being built in regions that were once scarcely populated, increasing the chances of impacts from localized extreme events. Even more concerning is the continued urban development in areas known to be at high risk of natural catastrophes, such as coastal regions, flood plains and wildfire-prone areas. In addition, the inflation of construction material prices, labor and socially driven litigation costs have significantly increased the replacement value of insured properties, making natural catastrophe losses ever more expensive. Nonetheless, there is consensus among climate scientists that global warming may have already played – and continues to play – an important role in the frequency and severity of some natural catastrophes. How can the (re-)insurance industry and ILS market rise to the challenge of managing the increasing impacts of a changing climate? A solid understanding of projected climate change impacts on natural catastrophes combined with a forward-looking portfolio management approach can help to steer the ILS industry away from unexpected losses while simultaneously capturing the increase in risk premiums driven by higher reinsurance demand, effectively transforming the challenge into an opportunity.

Aggregate annual insured losses caused by frequency perils and peak perils

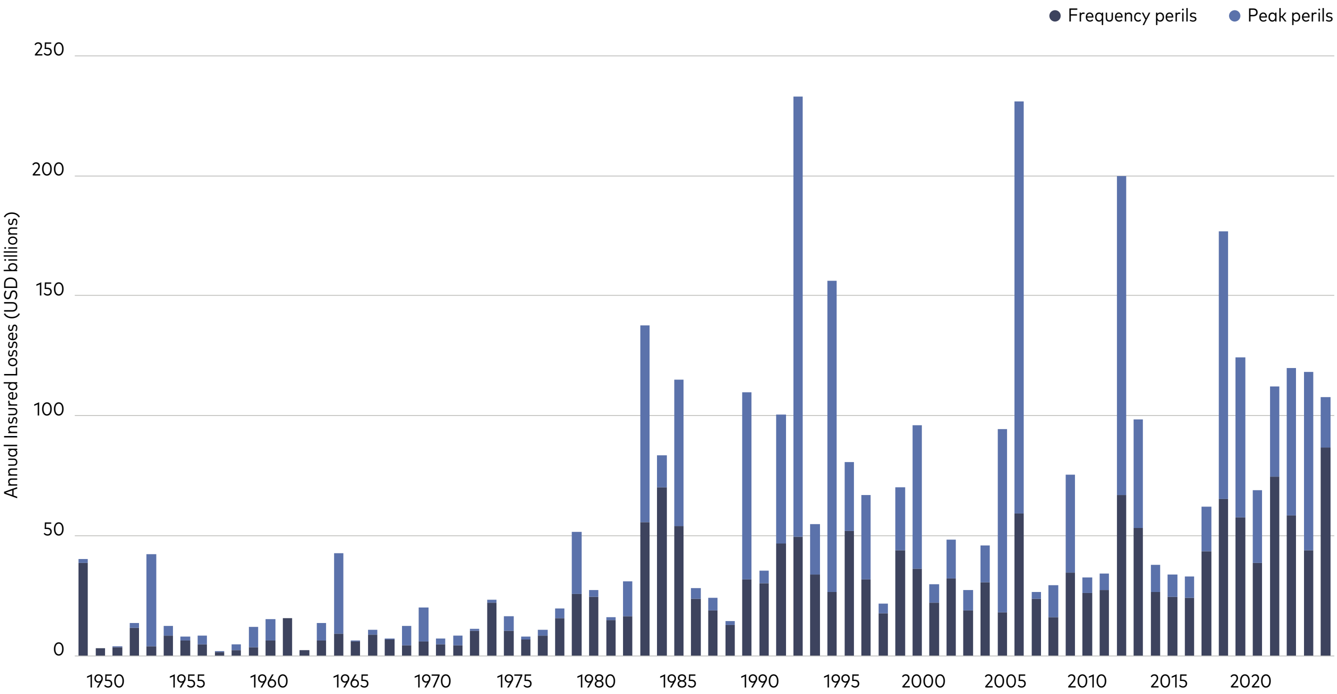


Fig. 2: Global aggregate annual losses from frequency perils (severe convective storms, wildfires, and floods) and peak perils (earthquakes, tropical cyclones, and extratropical cyclones) since 1950. The data for the United States was obtained from Property Claims Services (from 1950 to 2023), while the data for Europe, Japan, Canda, and Australia was obtained from Perils (from 1990 to 2023). Loss values are indexed to 2023 by correcting for changes in country GDPs and gross written insurance premia.

In this paper, we review the latest scientific insights into the potential effects of global warming on both peak and frequency weather perils. We discuss how a warmer atmosphere may theoretically impact each hazard based on the principles of physics, and we then summarize quantitative projections from modeling studies in different regions. Unless otherwise specified, the quantitative projections described are representative of high emission scenarios towards the end of the 21st century. The high emission scenario of reference in each study depends on the latest version of the Intergovernmental Panel on Climate Change (IPCC) assessment report (AR) available at the time of publication: studies published before 2014 generally refer to SRES A1B / A2 defined in AR4; studies published between 2014 and 2021 generally refer to RCP8.5 defined in AR5; recent studies published after 2021 refer to SSP5 defined in AR6. The projected increases in near-surface air temperature at the end of the 21st century for each of these scenarios are reported in Table 1. A qualitative summary of the projections for perils and regions that are most relevant to the ILS market is shown in Figure 3. While most studies agree on the direction of change, quantitative results for certain perils often exhibit significant levels of uncertainty, generally owing to a lack of long-term observations, an incomplete understanding of processes and limited high-resolution modelling studies[1]. Nevertheless, confidence around the projections is expected to increase as more high-resolution studies become available to accurately simulate fundamental small-scale atmospheric processes like convection and cloud formation. As a final point, we discuss how forward-looking ILS portfolio management combined with prudent deal selection can harness increased risk premiums while minimizing loss volatility from frequency perils.

Scenario	SRES A1B (AR4)	SRES A2 (AR4)	RCP8.5 (AR5)	SSP5 (AR6)
Best estimate	3.3 C	3.9 C	4.3 C	4.4 C
Likely range	2.2–4.9 C	2.5–5.9 C	3.2–5.4 C	3.3–5.7 C

Table 1: Projected increase in near-surface air temperature towards the end of the 21st century relative to the preindustrial period (1850–1900) for the high-emission scenarios referred in the cited literature. These values are reported in the Summary for Policymakers of the 4th, 5th, and 6th IPCC assessment reports (AR4, AR5, and AR6, respectively).

Qualitative projections of weather perils in key regions for the ILS market

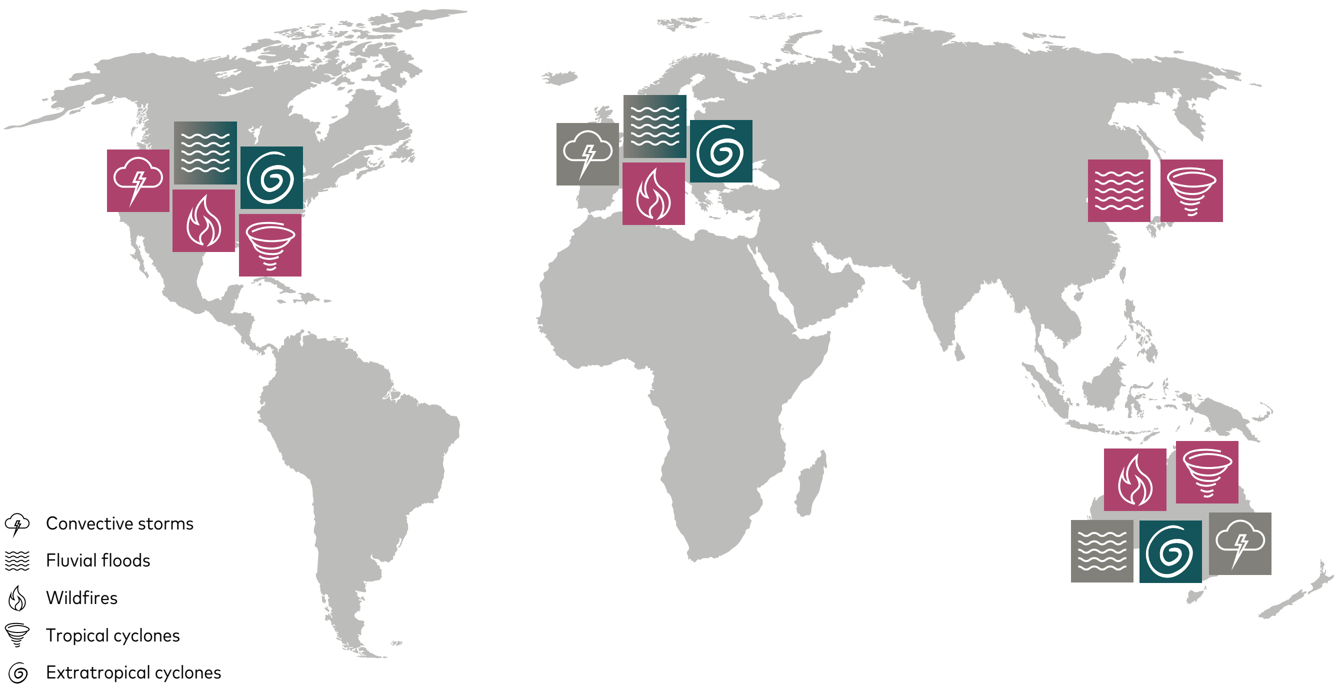


Fig.3: Summary of the expected impacts of global warming on the risk associated with convective storms, fluvial floods, wildfires, tropical cyclones, and extratropical cyclones with focus on the regions that are of most relevance to the ILS market (North America, Europe, Japan, and Australia). Red boxes indicate high confidence in an overall increase in the risk of the corresponding natural peril towards the end of the century. Gray boxes indicate low confidence in a projected increase in risk, due to limited process understanding, lack of detailed modeling results, or inconsistencies among studies. Gray and green boxes indicate that the risk of the corresponding peril is projected to have significant sub-regional variability, with a potential increase in certain areas and a decrease in others. Green boxes indicate that the risk of the corresponding peril is not expected to increase (see following sections for additional detail).

Extreme weather in a warmer climate

Severe convective storms

Severe convective storms (SCS) are associated with extreme hazards such as tornadoes, hail, heavy precipitation, strong straight-line winds and lightning. They are either embedded in large-scale weather systems, such as tropical cyclones and extratropical cyclones, or generated as individual mesoscale convective systems. They form under large-scale environmental conditions that are conducive to deep convection and are characterized by unstable atmospheric stratification, sufficient levels of moisture and strong vertical wind shear.

There is a growing body of literature describing the potential changes in SCS activity in the 21st century. Scientists generally agree that environmental conditions conducive to SCS formation, such as high convective available potential energy (CAPE), will intensify in response to increased greenhouse gas emissions. While this suggests that the atmosphere may become more favorable for SCS, there is no strong indication that the initial air lifting mechanisms necessary to initiate convection processes will become more prevalent in a warmer climate. The main findings regarding the potential impacts of global warming on specific SCS-induced hazards – i.e. hail, tornadoes and rainfall – are summarized below.

Hail
Anthropogenic climate change is expected to modify the environments in which hailstorms typically develop, with three properties likely to make the atmosphere more conducive to hail formation: warmer air temperatures, higher low-level moisture content and an increase in the melting level height. It is broadly expected that increased atmospheric temperatures and low-level moisture will lead to stronger air updrafts and higher liquid water content, both of which support the formation of larger hailstones. A rising melting level height in the atmosphere will increase the melting of smaller hail and is thus associated with a larger average hailstone size. While these changes underpin expectations that hail frequency on the ground should decrease over time, albeit with larger hail potentially becoming more common, regional variations in the projections may be significant[2].

To the best of our knowledge, there are no modeling studies that explicitly simulate convective processes over Europe within the existing body of scientific literature. Nevertheless, numerical analyses based on environmental proxies such as CAPE indicate that conditions that are supportive of hailstorms may become 40–80% more likely across large parts of Europe in the future. Importantly, the occurrence probability of hailstones larger than 5 centimeters in diameter is likely to double across parts of central and northern Europe[3]. In the US, convection permitting models suggest that the number of days per year with very large hailstones (>5 centimeters) may increase by almost 150%, with the largest impact in the central US4. In contrast, a significant decrease in the frequency of moderate size hailstones (2 – 5 centimeters) is predicted over the eastern and southeastern US[4,5]. In Australia, projections of future changes in hailstorms are uncertain. One modeling study explicitly simulating convection indicated a 40% relative increase in severe hail frequency in the Sydney Basin[6], with a halving of the return period of hailstones exceeding 10 centimeters. These results are in contrast to those of an earlier study, based on environmental proxies in a coarser resolution climate model, which did not find a potential increase in hail risk for southeastern Australia in a high emission scenario by 2050[7].

Tornadoes
The general expectation is that the number of days supportive of tornadic activity is likely to rise due to an increase in CAPE. Projected changes in tornado activity are twofold: (1) an increase in the mean annual frequency of powerful tornadoes (EF2 and stronger) and (2) larger inter-annual variability in the frequency of powerful tornadoes.

At present, there is no reliable direct quantification of future changes in tornado risk. The potential impact of a 50% increase in both the mean and the standard deviation of annual tornado frequency has been quantified for the US using a stochastic sampling technique[8]. Such an increase should be interpreted as the upper limit of a high emission scenario, rather than a realistic projection. Results suggested that this heightened activity may change the probability distribution of the total annual number of properties damaged by tornadoes, with a 50% increase in the mean and a 39% increase in the standard deviation.

Extreme rainfall
In the future, extreme rainfall is expected to increase by approximately 7% per degree of global warming due to the increased water vapor holding capacity of a warmer atmosphere, as quantified through the Clausius–Clapeyron relationship. Regional changes often differ from

theoretical expectations, however, depending on water availability[9,10], atmospheric circulation[11,12] and changes in convective storm sizes and translational speeds. In North America, extreme hourly precipitation is likely to show a relative increase in the range of 15% to 40%, combined with a systematic increase in convective storm sizes[13]. This will cause a significant increase in potential hourly total rainfall of between 20% and 40% in the mid- and high-latitude regions and of between 40% and 80% in lower latitudes. Enhanced flood risk may stem from convective storms with higher total hourly precipitation and slower translational speeds that may occur in the US Midwest and Mid-Atlantic and in Canada. In Europe, extreme hourly precipitation in the fall and in winter is projected to increase significantly, whereas the response is relatively flat for summer precipitation[14]. Given that summer and fall are the seasons that show the largest frequency of extreme hourly precipitation in the present climate, the tendency for greater increases in winter heavy precipitation suggests fundamental changes to the seasonal cycle of extreme events. In Japan, peak hourly precipitation may increase by 10% to 20% over the northern region and parts of its eastern regions[15].

Fluvial floods

Fluvial floods occur when rivers are unable to contain the flow of water, generally after prolonged and heavy rain saturates the soil, leading to rapid runoff into rivers. Changes in fluvial flood risk are commonly quantified using extreme streamflow as a proxy. The series of hydro-meteorological processes leading to fluvial flooding is highly complex. The rainfall-streamflow transformation depends on the intensity, duration and spatial distribution of rainfall, snow melt dynamics, terrain geomorphology, soil moisture dynamics, land use and evapo-transpiration processes. It follows that the projected increase in extreme precipitation based on thermodynamic considerations does not simply translate into an increase in extreme streamflow. The change in flood risk follows the change in extreme precipitation across regions where precipitation plays the dominant role in river discharge generation. Conversely, inconsistent changes are found where there are other generating factors in play, such as snowmelt and antecedent soil moisture.

Modeling studies provide varying projections in different parts of the world. Increases in flood frequency or magnitude have been identified for Japan, India, Southeast Asia, the high latitudes of North America, northern Europe and most of South America, with the current 100-year streamflow occurring at least twice as frequently[16,17,18] and the 30-year river discharge increasing by 20% to 50%[19]. Conversely, decreasing extreme streamflow has been predicted for central, eastern and southern Europe, and parts of South America as well as southern and central North America, where the 100-year streamflow will potentially more than halve in frequency[16,17,18] and the 30-year river discharge is projected to decrease by 10% to 20%[19]. Quantifications for Australia are again more uncertain, but most studies suggest an increase in flood risk in the north of the country and a potential decrease in the southeast[17,18,19]. Despite significant regional variability, a 4-degree global warming scenario would mean that countries accounting for more than 70% of the global population and global gross domestic product may face increases in fluvial flood risk[20].

Wildfires

The occurrence of wildfires requires the simultaneous presence of three factors: ignitions (a fire source), an abundant fuel supply (fuel load) and drought or extremely dry conditions. The primary sources of wildfire ignition can be natural, such as lightning, or anthropogenic, such as cigarettes, campfires, sparks from powerlines or arson. Fuel availability depends on the density of the surrounding vegetation, which is strongly influenced by human activities. For instance, agriculture and urban infrastructure increase fragmentation between vegetated areas and reduce landscape fuel continuity, whereas fire suppression efforts can have the adverse impact of causing an increase in the fuel load and fuel continuity. Droughts provide the necessary conditions for the generation of dry and therefore flammable vegetation in forested areas. In grassy landscapes, however, excessively long dry spells may actually reduce fine-fuel availability, thus reducing the fuel load and fuel continuity.

Global warming is often regarded as a key driver of accelerated wildfire activity. Even in regions of the world where mean annual rainfall is not expected to decline, warming may still increase evapotranspiration rates, leading to the presence and availability of drier and more flammable ignition materials. Moreover, higher atmospheric CO_2 drives plant growth and vegetation "litter", contributing to greater fuel continuity. The consensus among scientists is that a wildfire trend that is attributable to climate change has already emerged from natural climate variability in several regions of the world, including the western US, Canada, southern Europe, Siberia and Australia[21]. Climate projections indicate that a lengthening of the wildfire season and an increase in the area burned will continue to develop towards the end of the century. In California, the number of large fire days could double by the end of the century[22], and extreme daily wildfire growth may increase by 170% relative to pre-industrial levels[23]. In the Mediterranean, the number of fires could potentially double by 2050 under a high emission scenario, but no significant increase in the total burned area is expected[24]. In southeastern Australia, the number of days with environmental conditions conducive to extreme, pyrocumulonimbus-type wildfires may increase by up to a factor 2 during spring[25].

Tropical cyclones

Tropical cyclones form and develop as a result of four main factors: moist air, warm ocean water, a pre-existing disturbance such as a thunderstorm and low wind shear. Based on the principles of atmospheric physics, these contributing factors are more likely to occur in the future, resulting in an environment that is more conducive to hurricane formation and intensification. As previously mentioned, a warmer atmosphere can hold a larger amount of water vapor, and in addition, a warmer ocean surface can supply a larger amount of water vapor to the atmosphere due to increased evaporation. Furthermore, as the poles will tend to warm faster than the equator, the jet stream and the associated vertical wind shear are expected to potentially become weaker. Given the relevance of North Atlantic hurricanes for the ILS market, we provided a detailed analysis of trends and projections for this natural peril in a 2022 white paper[26].

Modeling studies indicate a projected increase in lifetime maximum surface wind speeds of between 1% and 10% in a 2-degree warming scenario, with expected changes in the Northwestern Pacific (i.e. Japanese typhoons) exceeding those in the North Atlantic (US hurricanes) and in the Southwest Pacific (Australian cyclones)[27,28]. It follows that the fraction of tropical cyclones reaching major intensity (category 4 and 5) may increase by 13% on average. The precipitation associated with tropical cyclones is expected to grow globally by 5% to 20% in a 2-degree warmer world[29,30], with a median increase of 15% in the North Atlantic and Northwester Pacific and of 7% in the Southwestern Pacific. There is no indication, however, that the overall frequency of tropical cyclones will increase in the future. It should be noted that the projected sea level rise is likely to severely increase the risk of flooding during a hurricane surge. A case study for New York City suggested that the combined effects of hurricane intensification and a 1-meter sea level rise may cause the present 100-year surge flooding to occur every 3 to 20 years and the present 500-year flooding to occur every 25 to 240 years by the end of the century[31].

Extratropical cyclones

Extratropical cyclones (ETC), also known as winter storms, usually originate at between 30- and 60-degrees latitude, when cold air masses from the poles come into contact with warmer air masses from the equator. ETC do not usually attain the high wind speeds of tropical cyclones but can be significantly larger and affect tens of thousands of square kilometers as they track across land. Besides strong winds, ETC are often characterized by heavy rainfall or snowfall, extremely low temperatures and storm surges in coastal regions. To date, studies provide no strong indication that global warming will affect ETC maximum wind speeds. It is expected, however, that the frequency of ETC may decrease in certain regions because of a poleward shift of the mean storm tracks1. In addition, there is high confidence that precipitation associated with ETC is likely to intensify due to the increased water vapor content in a warmer atmosphere.

The response to global warming across Europe is characterized by a tripolar pattern showing an increase in the number of ETC in central Europe and a lower number in the Norwegian Sea and the Mediterranean Sea[32]. The total number of European ETC may decrease by 7%, whereas the number of ETC with strong precipitation (greater than the 90% quantile in the historical baseline) may increase by 60%. In the northeast US, the overall frequency of ETC may decrease by about 10%, but the number of ETC associated with strong precipitation may increase by 25% to 50% per year[33]. Moreover, the frequency of extreme snowstorms in the northeast US may decrease by 50% or more due to the lower proportion of precipitation falling as snow in a warmer atmosphere. In Australia, projections for winter storms, also known as east coast lows, do not indicate significant changes to the 20-year return period onshore wind speeds but they do point to a potential increase in 20-year daily precipitation in the order of 25%[34].

Discussion and conclusions

In 2023, greenhouse gas emissions drove the global mean surface temperature to 1.5 degrees above pre-industrial levels. Some of the large-scale impacts of global warming on the climate system are already becoming apparent, such as an increase in the frequency of heatwaves and droughts. Other potential impacts, such as changes in the frequency and severity of natural catastrophes, are not yet clearly visible but may materialize in the future. Several studies have suggested that future changes in "non-peak" frequency perils, such as severe convective storm, floods and wildfires, may be significant, with strong regional variations. Even though consensus exists around the direction of these changes, scientific studies have not provided any conclusive indications of their scale and current projections are generally uncertain. Expected changes for peak perils are instead delivered with higher confidence: earthquake risk will almost certainly not be affected by global warming, while tropical cyclones will likely become more intense but not necessarily more frequent. In a recent article, we assessed the potential impacts of North Atlantic hurricane projections on the US property insurance industry. This research suggested that hurricane losses could increase by 10% to 25% in a 4-degree warmer world, with greater impacts at lower return periods than in the tail (Figure 4, panel a). Furthermore, the average annual loss caused by North Atlantic hurricanes could increase by up to 16%, with the largest relative increase attributable to precipitation-induced losses (Figure 4, panel b).

Impacts of global warming on hurricane-driven insurance losses in the United States

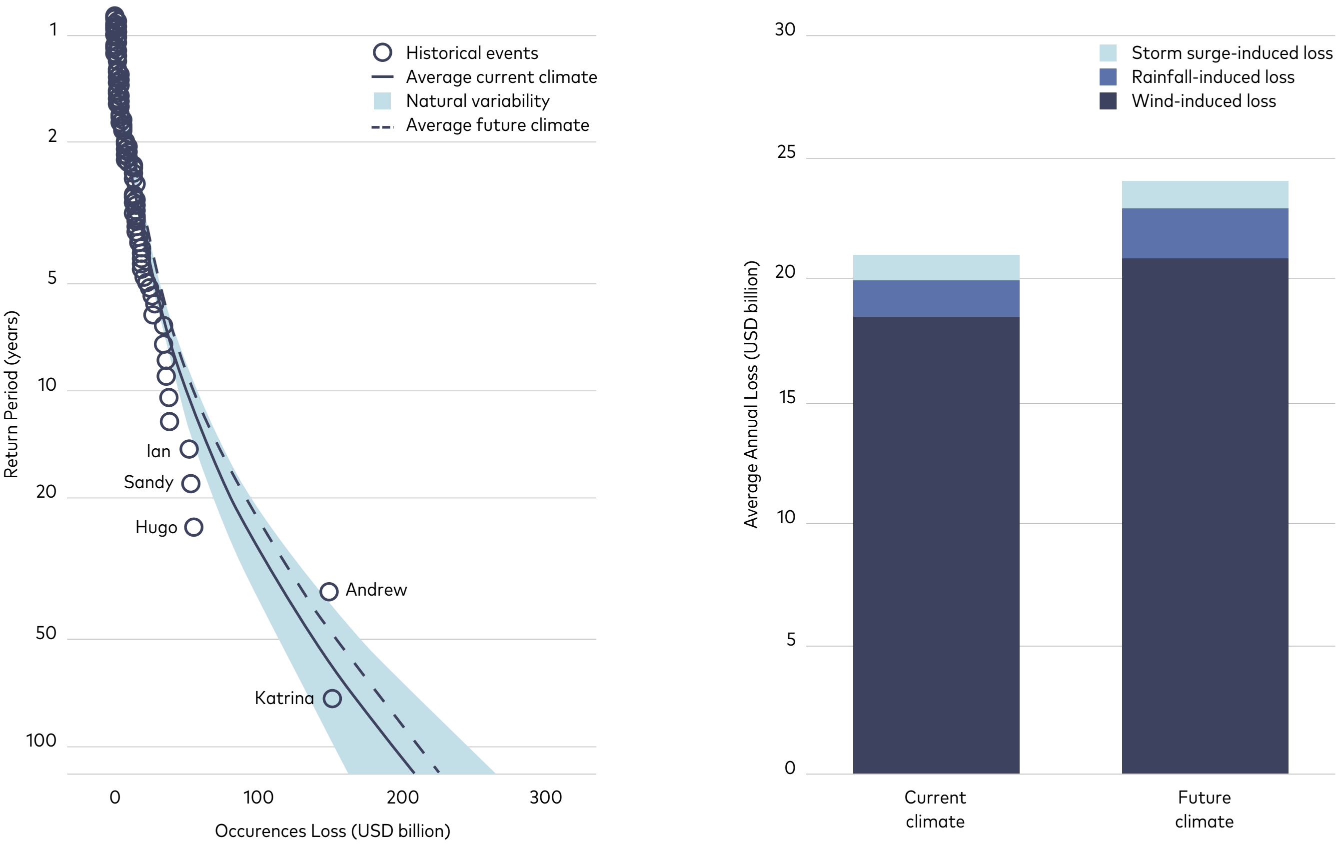


Fig. 4: Potential impacts of a 4-degree global warming on US property insurance losses from North Atlantic hurricanes. (a) Exceedance frequency curves of hurricane occurrence losses in current climate conditions (solid blue line) and future climate conditions (4-degree warming, dashed blue line). The shaded blue area indicates natural climate variability (inter-quartile range) and the black circles show historical event losses indexed to 2023. (b) Impacts of global warming on average annual losses caused by the three main hurricane hazards, namely wind, precipitation, and storm surge. These results do not include the potential impacts of sea level rise on the storm surge-induced losses.

The critical question is: how can the (re-)insurance industry and ILS managers hedge against the risk of more frequent severe convective storms, floods and wildfires if quantitative projections remain elusive? First, insurers should aim to increase regional diversification in their portfolios to avoid exposure concentrations in areas that may be severely impacted by localized extreme events. As an ILS manager, we aim to reduce our allocation to cedents with concentrated local exposures, minimize support of frequency covers and specifically target layers attaching at higher levels to avoid impacts from non-peak perils and "non-catastrophic" events. This approach will make it possible to retain the desirable risk from peak perils at an attractive premium, while effectively managing the potential increase in mid-sized losses from secondary perils that is predicted to occur in a warmer world.

Figure 5 illustrates this concept using the US insurance industry losses of a well-known cat model, Verisk Extreme Event Solutions. Assuming a 30% potential increase in the occurrence losses from frequency perils, the lower attaching layer 1 may be impacted twice as frequently from a frequency peril in the future, i.e. once every 10 years on average, instead of once every 20 years. Conversely, the higher attaching layer 2 will rarely be impacted by a frequency peril in the future climate scenario, i.e. on average once every 100 years. Furthermore, peak perils trigger a reinsurance payout to layer 2 on average once every five years, with only minor impacts from the projected increase in hurricane losses due to climate change. Given the uncertainties underlying the climate change projections for frequency perils, the higher attaching layers 2 and 3 are therefore more prudent investments.

ILS managers should target higher attaching layers

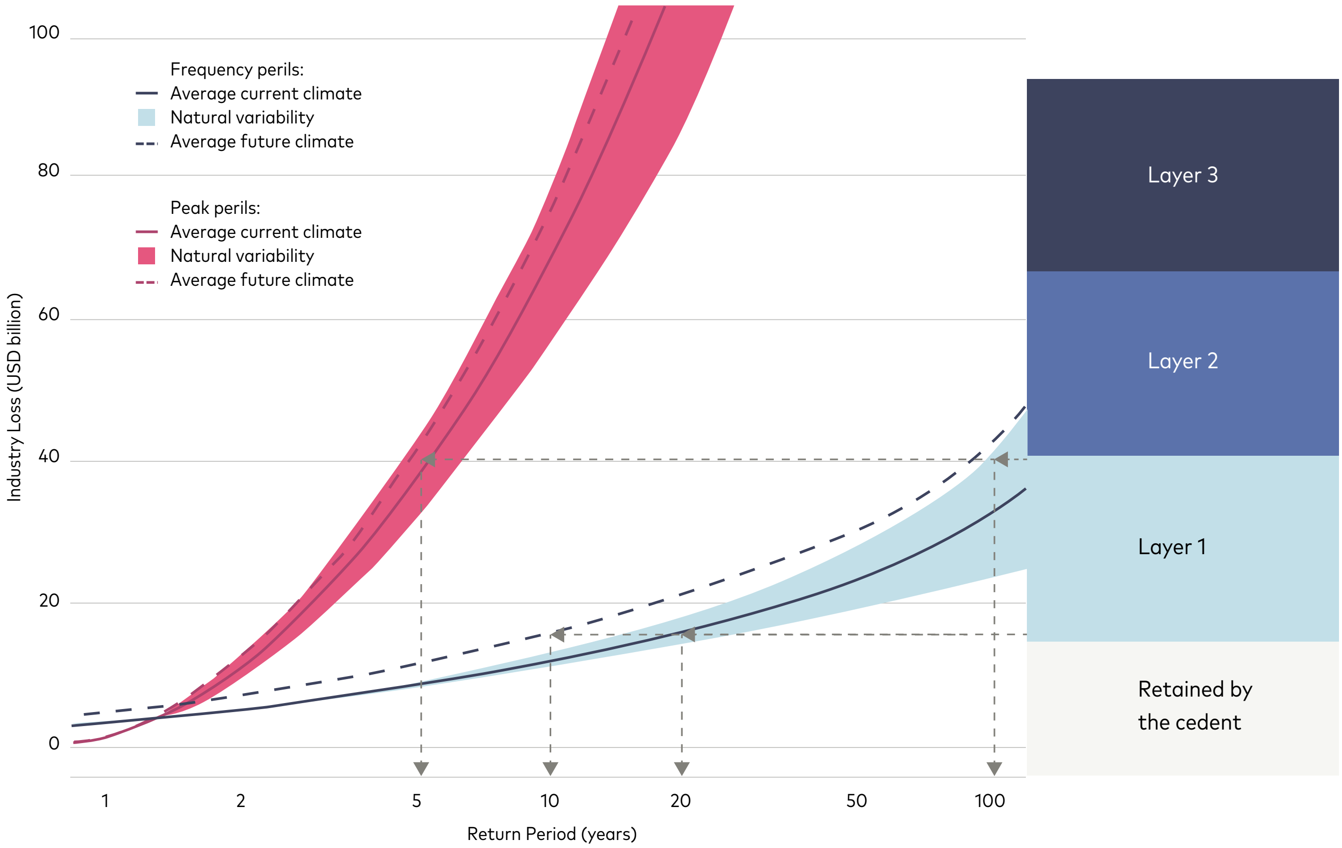
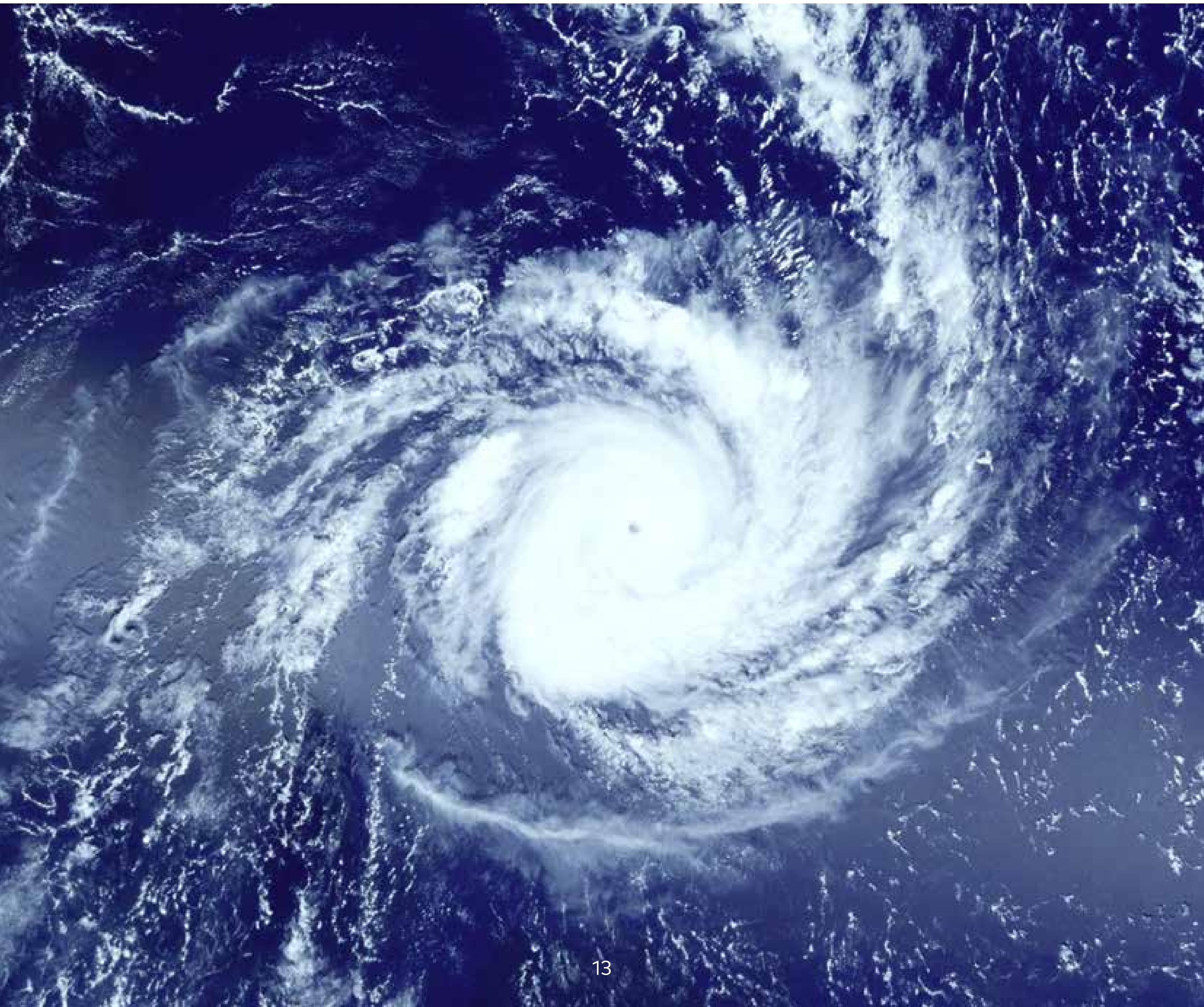


Fig. 5: Occurrence loss exceedance frequency curves for frequency perils and peak perils in current climate and future climate conditions. Solid blue and red lines indicate average values in current climate conditions, as modeled by Verisk Extreme Event Solutions. Shaded blue and red areas indicate natural variability, expressed as +/- one standard deviation around the mean. Dashed blue and red lines indicate average values in future climate conditions (15% increase in hurricane losses and 30% increase in frequency perils losses). The right side of the picture illustrates an example of an Occurrence XL reinsurance structure.

Finally, the EU regulation recognizes that ILS investments ultimately support economic activities aimed at mitigating and adapting to the impacts of climate change. With the introduction of the European Sustainable Finance Disclosure Regulation (SFDR), the associated EU Taxonomy specifically lists non-life catastrophe insurance as an "enabling" investment activity, classifying ILS as a sustainable investment. If a homeowner chooses to buy protection against climate-related perils such as hurricanes or floods, this effectively assigns a tangible cost to climate-related insurance events by assigning an insurance premium for the cover. Increases to insurance premiums as a result of climate change are considered as an incentive for society to invest in preventive measures, which is, in turn, expected to increase the resilience of communities to natural disasters. While insurance companies will increasingly depend on the supply of ILS capital to support their regulatory capital requirements in a warmer, higher-risk climate, ILS investors can benefit from attractive returns for assuming a truly uncorrelated risk, with the benefit of the classification as Article 8 sustainable funds under the SFDR rule.

In summary, the implications of global warming and climate change for (re-)insurance and ILS are two-fold: 1) a likely but not precisely quantified increase in losses due to more frequent and intense non-peak perils; 2) an equal or larger increase in reinsurance premiums due to higher risks and underlying uncertainties. ILS managers can therefore seize the opportunity to achieve improved returns while, at the same time, hedging against higher risks by avoiding exposure concentrations and by performing careful deal selection. Most importantly, special attention will have to be given to other important loss drivers, such as inflation, litigation and insured exposure growth, which will very likely impact insurance property losses to a larger degree than global warming. As witnessed in 2023, a diversified portfolio of ILS transactions with a clear focus on single extreme events can generate an attractive return, even in a year with increased event activity and elevated insured losses, with the additional benefit of ILS' classification as a sustainable investment under the EU taxonomy.



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