Economic recovery after disaster strikes - volume two

When communities face flood, fire and hail

A REPORT FOR SUNCORP

SGS Economics & Planning

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Glossary

Term	Definition	Abbreviation
Australian Statistical Geography Standard	The Australian Statistical Geography Standard is the Australian Bureau of Statistics' geographical framework.	ASGS
Bureau of Meteorology	The Bureau of Meteorology is Australia's national weather, climate and water agency	BOM
CBD	Central Business District	CBD
Gross Domestic Product	Is the measure of income generated by an economy.	GDP
Natural Disaster Relief and Recovery Arrangements	Through the NDRRA, the Australian Government provides financial assistance directly to the states to assist them with costs associated with certain disaster relief and recovery assistance measures	NDRRA
Statistical Areas	Statistical Areas (1,2,3 or 4) are geographic units defined by the Australian Bureau of Statistics.	SA
Suncorp insurance	Refers to all brands including: AAMI, GIO, Suncorp Insurance, Vero, Apia, Shannons, CIL and Bingle	..
UTAS	University of Tasmania	UTAS

Executive Summary

Three economies impacted by recent natural disasters had an estimated $4.0 billion economic boost from insurance claims and recovery activity. The Townsville floods, Black Summer bushfires, and East Coast hailstorms across multiple states had a devastating – and potentially permanent – effect on local economic activity. This report considers what role insurance played in restoring local economic activity and reducing the long-term impacts of these natural disasters.

This report examines three severe natural disaster events in Australia between 2019 and 2020: the Townsville floods, Black Summer bushfires, and East Coast hailstorms. Events of this kind are becoming increasingly common and present a real challenge for communities across the country. Natural disasters damage and destroy homes, business premises, vehicles and essential infrastructure. They also destroy crops and physical capital, close businesses, and disrupt normal economic production as workers cannot get to work or access required materials, leaving factories to sit idle.

Insurance provides a way to mitigate the adverse economic impact of natural disasters. The income from insurance payments helps to stabilise the economy following the initial shock from the disaster, and the economic stimulus from claims payments and recovery activity promotes a quicker return to normal economic activity. Without insurance, a regional economy may never fully recover from a natural disaster as damage leads, in some cases, to a permanently impaired productive capacity in the long term.

As an example, the economic impact of the Townsville floods in 2019 was estimated to be a $2.5 billion reduction in Gross Domestic Product (GDP). This represents a 0.8 per cent decrease in GDP of the areas impacted by the Townsville floods. The 2019 GDP of communities significantly impacted by flooding, such as the Townsville urban area, would have been reduced by as much as 20 per cent without the recovery aided by insurance payouts.

During 2019, the claims and recovery activity from the insurance industry boosted the economy by over $1.4 billion, compared to a scenario of no insurance payments (0.4 per cent). In the following year, an additional $0.9 billion was added to GDP (0.3 per cent). The cumulative economic impact from insurance payments being injected into the local economy over three years from 2019 to 2021 is estimated to be $2.9 billion.

Insurance plays a significant role in mitigating adverse outcomes and helping to restore normal economic activities, particularly in regional areas which have a narrower economic base (often dominated by capital-intensive sectors like resources and agriculture) and have limited employment opportunities compared to larger urban areas.

The Black Summer bushfires and East Coast hailstorms case studies confirm this finding. The economic impact of the bushfires is estimated to be $4.6 billion, or a 1.8 per cent reduction in the affected regions GDP. Following the bushfires, as of August 2020, the insurance industry had paid out $2.4 billion, $244 million of which has been paid out by Suncorp and its brands on insurance claims and recovery activity. These insurance payments across the industry have helped to add $2.5 billion (1 per cent) to the affected local economies and reduced the economic impact of the bushfires.

Following the East Coast hailstorms in January 2020, as of August 2020, the insurance industry had paid out $1.6 billion, including $370 million paid out by Suncorp through claims and recovery activity. Motor claims accounted for over 60 per cent of Suncorp claims, and building claims accounting for 34 per cent. The claims and recovery activity payments by the insurance industry boosted the economy of the affected areas by over $1.4 billion in 2020.

KEY FINDINGS

Without insurance, some communities will never recover from a natural disaster.

This is especially the case in regional Australia, where there is increased risk of disasters and communities have a narrower economic base.

Insurance helps to stabilise the economy following the disaster, and the economic stimulus promotes a more rapid return to normal economic activity.

KEY STATISTICS

Initial GDP contribution from total insurance payments being injected into the local economy is $4.0 billion.

- Townsville floods $1.4 billion.
- Black Summer bushfires $1.2 billion.
- Hailstorms $1.4 billion.

Cumulative GDP contribution over 3 years is $6.8 billion.

- Townsville floods $2.9 billion.
- Black Summer bushfires $2.5 billion.
- Hailstorms $1.4 billion.

WORST IMPACTED COMMUNITIES

- Townsville (QLD) 20% reduction in GDP in 2019 from the Townsville floods
- East Gippsland (VIC) 19% reduction in GDP in 2020 from the summer bushfires
- Shoalhaven (NSW) 12% reduction in GDP in 2020 from the summer bushfires
- South Coast (NSW) 12% reduction in GDP in 2020 from the summer bushfires
- Adelaide Hills (SA) 3% reduction in GDP in 2020 from the summer bushfires
- Boroondara and Stonnington (VIC) 2% reduction in GDP in 2020 from the hailstorms

01 Introduction

Insurance provides communities with the resilience to deal with natural disasters. This is particularly important in areas of high economic activity or low socioeconomic status exposed to a high level of risks from natural hazards.

Natural disasters, such as bushfires, floods, and tropical cyclones, are an enduring part of the Australian environment. They are a traumatic experience for the community and harm the local economy by destroying and damaging homes, business premises, and economic and social infrastructure.

In addition to the loss of physical capital, natural disasters disrupt the normal economic production within a region. Retail businesses are closed, workers cannot get to the office, crops are destroyed, and factories sit idle without raw material. Depending on the scale of the natural disaster, people may choose to leave a region rather than rebuild. This loss of population then impacts on the productive capacity of the economy.

Australia's economic performance could be undermined by the increasing prevalence and severity of natural disasters. Household and business insurance, along with mitigation strategies, provide communities with the resilience to deal with natural disasters. This is especially important in areas of high economic activity or low socioeconomic status exposed to a high level of risk from natural hazards.

This report considers the economic impacts of natural disasters and the benefit that insurance played over 2019-2020 by assessing three severe natural disaster events:

- Townsville floods: January 2019
- Black Summer bushfires: December-January 2020
- East Coast hailstorms (multiple states): January 2020

Events of this kind are becoming increasingly common and present a real challenge for communities across the country. This report builds on previous work examining the impact of Cyclone Debbie in 2017, the Tathra bushfires and the Hobart floods in May 2018. There were common findings between the studies on the importance of income from insurance payments helping to stabilise the economy following the initial shock from the disaster.

Figure 1 shows the total insured losses for each disaster and the number of claims lodged across all insurance providers. The Insurance Council of Australia (ICA) estimated the cost of insurance claims from the summer bushfires was $2.4 billion, with over 38,000 claims lodged. The estimated cost of insurance claims for the East Coast hailstorms was $1.6 billion, with 125,000 claims lodged. For the Townsville floods in 2019, the estimated cost of insurance claims was $1.3 billion, with over 30,000 claims lodged.

These three events were selected as they vary in geography, demographics, the type of impact, the magnitude of insured losses and claims lodged, and are major disasters that have occurred within the last 18 months. Considered together, they provide a useful comparison of the economic impact of disasters based on size, type of impacts (e.g. property, motor or business), urban versus rural, and densely populated versus more sparsely populated areas.

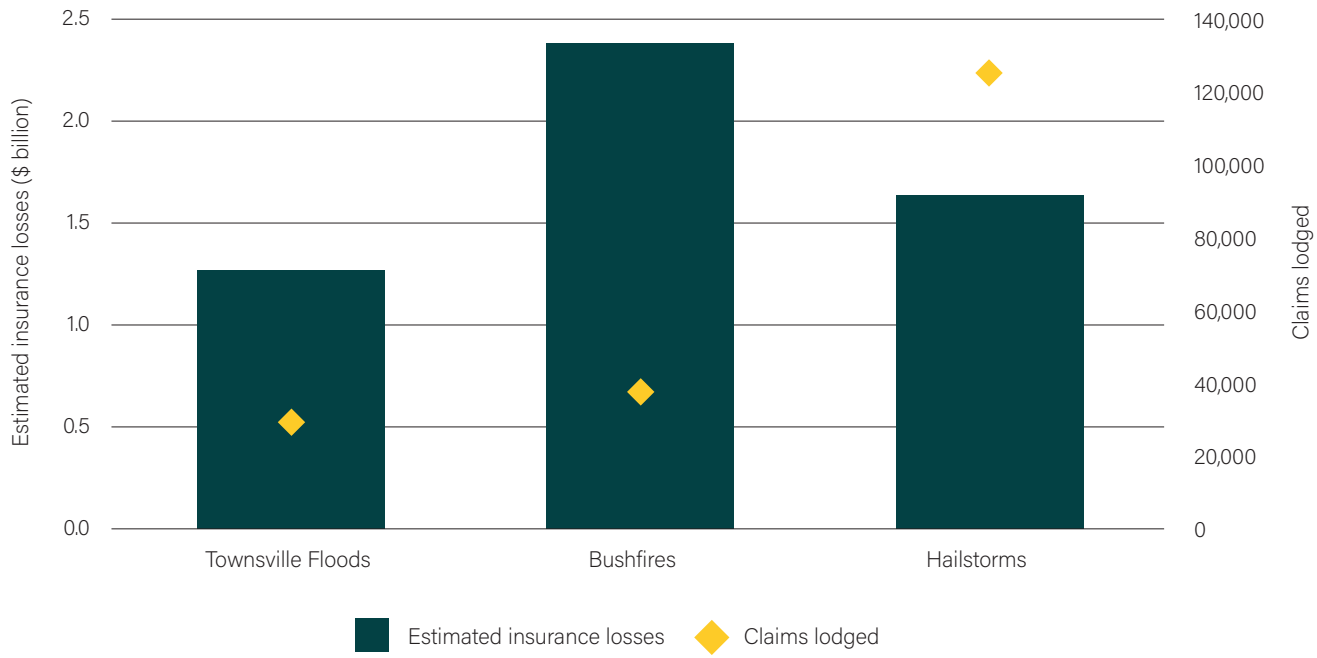
Suncorp is one of Australia's largest general insurance companies, with over eight million customers across Australia. Its brands include AAMI, GIO, Suncorp Insurance, Apia, Shannons, Vero, CIL and Bingle. Suncorp provided support for customers affected by the three natural disaster events analysed in this report: the Townsville floods, Black Summer bushfires and the East Coast Hailstorms.

It is important to note that many of the communities affected by these disasters are still recovering. Following a disaster, there are three main stages of recovery. Recovery begins with the emergency response stage, which takes place immediately after the disaster. Following the recovery stage is the restoration stage, which includes restoring basic services, clearing debris and making buildings and structures safe. This stage is where damages are assessed, and insurance claims lodged to begin the process of recovery. The assessments spark a reconstruction phase, where buildings and infrastructure are repaired or rebuilt. The reconstruction stage can take years depending on the extent of the damage to properties and infrastructure.

The methodological approach for this report is outlined in the following chapter. At a high level, SGS has created two scenarios of GDP for the regions impacted by these disasters. The first scenario assumes the stimulus of insurance claims and recovery activity flowed through the economy and the second scenario assumes there was no stimulus. This approach allows the impact of insurance to be isolated for each case study.

Analysis has been conducted at the Statistical Area 3 (SA3) level. Statistical Areas are geographic units defined by the Australian Bureau of Statistics (ABS). SA3s are the third smallest Statistical Area and represent regions of between approximately 30,000 and 130,000 people. Analysis at the SA3 level is particularly insightful for these large-scale disasters, that impacted large parts of Queensland, New South Wales, Australian Capital Territory, South Australia and Victoria.

FIGURE 1: SCALE OF DISASTER BASED ON TOTAL INSURED LOSSES AND NUMBER OF CLAIMS[1]



[1]As at October 2020

Source: Insurance Council of Australia Data

02 Economic modelling

Economic modelling estimates the size of the economic impact of three natural disaster events during 2019 and 2020 and the economic benefit of insurance provided by Suncorp.

It is important to understand the difference between insurance losses and economic loss. Insurance losses related to natural disasters capture the losses accruing to insured assets (e.g. homes, motor vehicles and business premises).

Economic losses relate to the loss of economic production because of natural disasters. For example, businesses forced to close will miss daily takings, workers cannot reach their workplace, and factories remain idle without required materials. Depending on the scale of the natural disaster, people may choose to leave a region rather than rebuild. This loss of population then impacts the economy in the longer term.

This section briefly outlines the economic modelling used to estimate the size of the economic impact of the natural disasters and the economic benefit of insurance provided by Suncorp. It should be noted that other benefits such as improved mental health outcomes, reduced alcohol and drug use and changes to school academic outcomes are not included in the economic modelling.[2]

The COVID-19 pandemic represents the most significant challenge to the Australian economy since the Great Depression. The social distancing restrictions that have shut down large parts of the economy are unprecedented, and Australia's GDP has contracted significantly during the 2020 calendar year.

The uncertainty surrounding the COVID-19 recession means forecasting GDP growth in 2021 and beyond is very difficult, especially at the small area level. Given the aim of this report is to understand the impact of the natural disaster in question and not the impact of COVID-19, it has been assumed that future growth in 2021 will return to normal trend levels. The *with* and *without disasters* scenarios are then compared to understand the economic benefits of insurance.

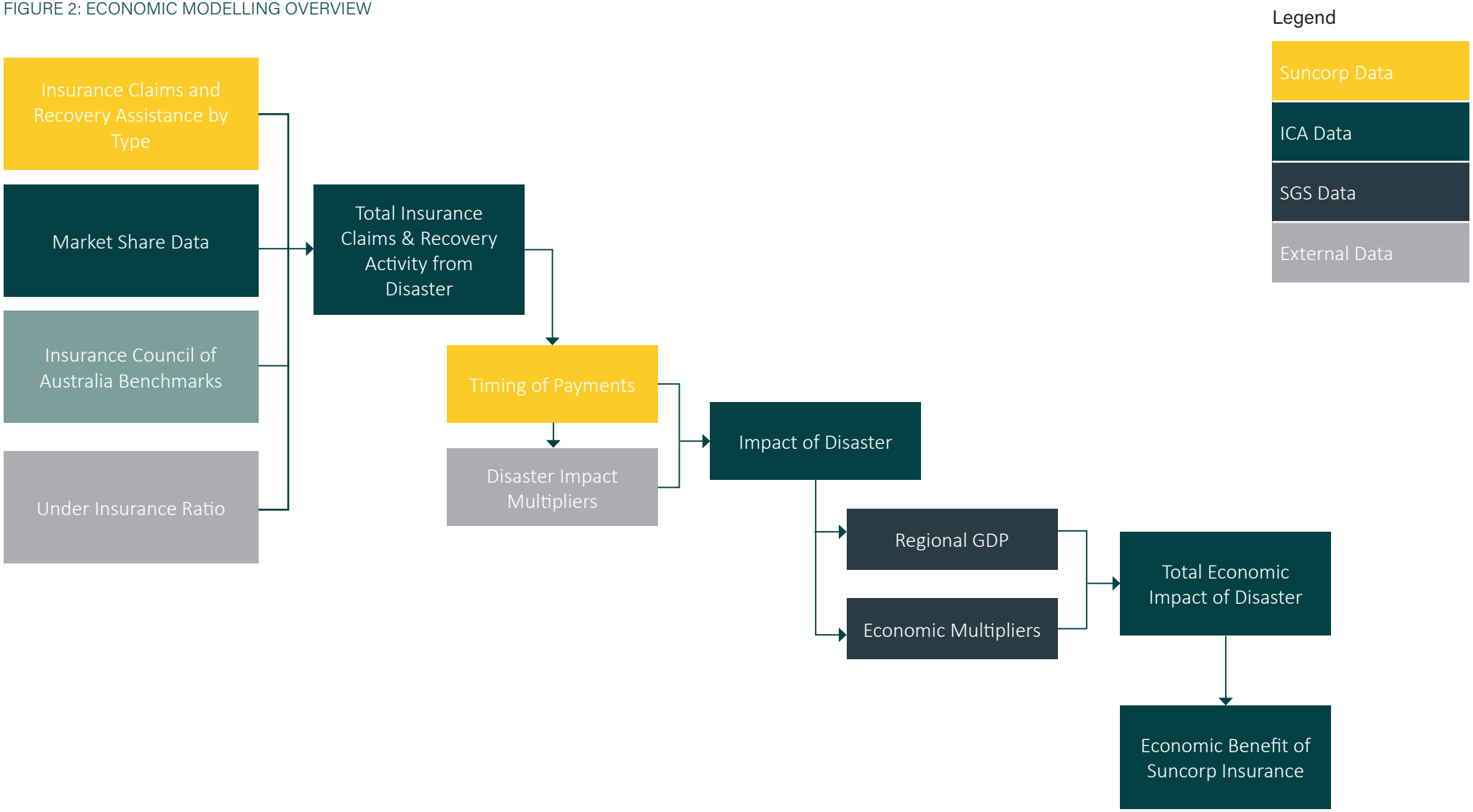
This simplifying assumption means that the economic benefits of insurance might be understated. The stimulus of insurance payouts could be having a greater effect in areas which are heavily impacted by COVID-19. For example, the East Gippsland tourism sector has been impacted due to COVID-19 restrictions and hence insurance payouts in this area could have a greater multiplier effect.

The first input is insurance claims and recovery activity data from Suncorp[3]. This is provided for each disaster case study and broken down into the following categories:

- Home insurance (split into buildings and home contents)
- Motor Vehicle Insurance
- Commercial Insurance (split into motor vehicle, buildings and commercial insurance).

[2]For more information about these less viable costs see
http://australianbusinessroundtable.com.au/assets/documents/Report%20-%20Social%20costs/Report%20-%20The%20economic%20cost%20of%20the%20social%20impact%20of%20natural%20disasters.pdf
[3]This includes AAMI, GIO, Suncorp Insurance, Vero, Apia, Shannons, CIL and Bingle brands

FIGURE 2: ECONOMIC MODELLING OVERVIEW



Source: SGS Economics & Planning

The data was provided at the post code level and was then aggregated to the Statistical Area 3 level. The date at which the insurance is paid has also been provided for each disaster.

Suncorp's insurance claims and recovery activity data is the total for all Suncorp brands up to August 2020 (AAMI, GIO, Suncorp Insurance, Vero, Apia, Shannons, CIL, and Bingle). Estimates of total insurance payouts for claims and recovery assistance figures for an event are based off Suncorp insurance and market share data combined with benchmark data from the Insurance Council of Australia for total insurance payouts. An adjustment is then made to account for households and businesses who are self-insured. There is a lack of data on the level of self-insurance however, best estimates indicate a very low percentage of the population are self-insured. After conversations with the Insurance Council of Australia, SGS assumed that 10 per cent of households / businesses are self-insured.

Previous research undertaken by the Bureau of Infrastructure, Transport and Regional Economics and Deloitte Access Economics has examined the relationship between insurance payouts and the loss of economic production. This research produced disaster multipliers which can be used to convert insurance payouts to economic loss.

For example, if insured losses from a bushfire is estimated at $1 million and the estimated multiplier is 3 then total economic cost would be estimated at $3 million.

Table 1 presents the multiplier used for each of the case study disasters. Also presented is the upper and lower bounds provided in the previous research. The disaster multiplier for the hailstorms is set to 1 as, despite their intensity, the hailstorms did not impact economic activity in the days following the disaster.

The economic stimulus from Suncorp's insurance claims and recovery activity categories (buildings, home contents, motor vehicle) are allocated to different expenditure categories with different economic multipliers that vary by region (as shown in Table 2).

These multipliers reflect supply chains within each region and how much expenditure is lost from the local area. Cities have higher multipliers than regional areas because they capture more stimulus and motor vehicles have multipliers below one because cars are imported from overseas and therefore have a reduced impact on an economy.

TABLE 1: DISASTER ECONOMIC MULTIPLIERS

Disaster Type	Average Multiplier Used	Lower Bound	Upper Bound
Townsville Flood	2	2	10
'Black summer' Bushfire	3	3	5.3
Hailstorms	1	1	3

Source: SGS Economics & Planning and Deloitte Access Economics

> *A 2015 report by Deloitte Access Economics found that the intangible costs of disasters – including increased family violence, mental health impacts, chronic disease, alcohol and drug use, short and long term unemployment, changes to school academic outcomes, and crime – are at least equal to, if not greater than, tangible costs.*

A GDP scenario *without insurance* was estimated for each SA3 impacted by the case study disasters. Given each disaster occurred roughly in the middle of the year, the financial year estimates of GDP were converted to calendar year estimates. This methodology ensures a more accurate assessment of the economic impact, rather than presenting an impact for one or two months at the end of the financial year.

This report estimates the economic impact of three case study disasters using insurance claims figures from the ICA and Suncorp. Two scenarios of GDP were prepared, one with the stimulus of insurance claims and recovery activity flowing through the economy, and the second with no stimulus. This allows the impact of insurance to be isolated for each case study. More detail on the method used to estimate small area GDP is provided in the appendix.

TABLE 2: REGIONAL ECONOMIC MULTIPLIERS FOR EACH INSURANCE PAYMENT TYPE

Region	Building	Contents	Motor Vehicles
Greater Sydney	1.34	1.15	0.75
Rest of NSW	1.20	1.06	0.54
Greater Brisbane	1.29	1.07	0.72
Rest of Qld	1.18	1.01	0.56
Greater Hobart	1.09	1.10	0.59
Rest of Tas	1.09	1.10	0.59
Greater Melbourne	1.30	1.15	0.72
Rest of Vic	1.13	1.04	0.47
Canberra	1.09	1.10	0.59

Source: SGS Economics & Planning

03 Disaster case studies

Disaster response has three distinct phases: emergency response, restoration of basic services and reconstruction. How communities respond to the disaster depends on the nature of the disaster and characteristics of the region. This report examines three case studies, Townsville floods, Black Summer bushfires and East Coast hailstorms, to understand the disaster response process.

3.1 Disaster Recovery

Natural disasters are a traumatic experience for the affected community. A community's recovery pathway following a natural disaster depends on the scale of the natural disaster, the resilience of the community and the speed of the recovery process.

Following a natural disaster, there are three main stages of recovery:

- Emergency response – takes place immediately after the disaster.
- Restoration – work begins on restoring basic services, clearing rubble and debris, and making buildings and the built environment safe. Assessments are made of the damage and insurance claims are lodged.
- Reconstruction – management of insurance claims and associated reconstruction begins.

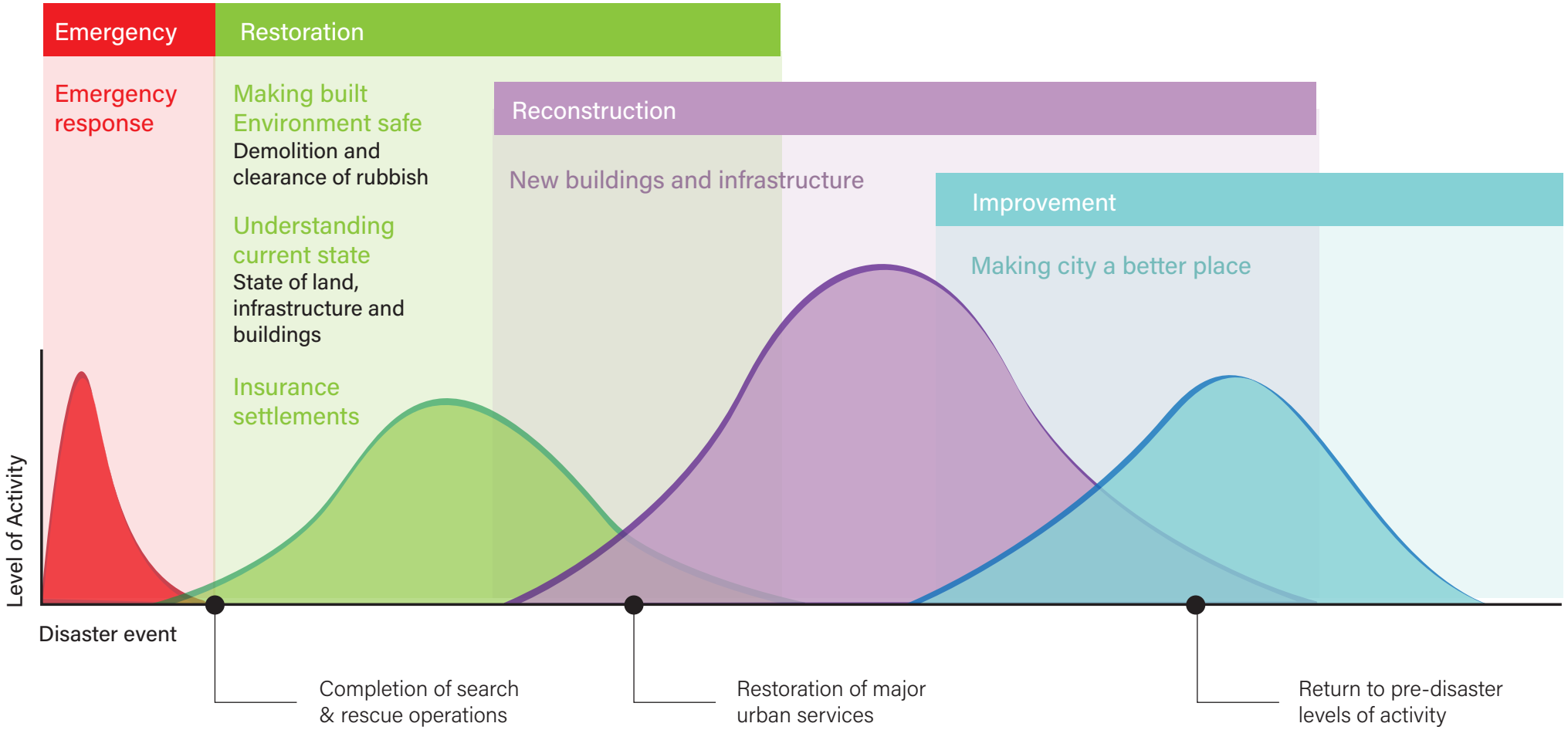
Suncorp has refined and developed its claims response with each disaster that has affected its customers. Following an event, dedicated Suncorp teams are established and sent to an area affected by a natural disaster to meet customers, assess claims, and work with local authorities and services to rectify the situation for each customer as quickly as possible.

Reconstruction is the phase when many buildings have been repaired / rebuilt and infrastructure repaired. This reconstruction stage lasts longer than the emergency response and restoration stages and can take years[4].

Insurance is an important component of natural disaster recovery. Natural disasters can destroy the productive capacity of economies, and slow economic recovery can drive residents and businesses to leave impacted regions. A successful recovery is measured by a communities ability to rapidly regain what they have lost and catch up to where they could have progressed to. Insurance payouts for claims and recovery activity provide an economic stimulus that speeds up the rate of recovery for regional economies and limits further losses of economic activity.

[4]R. W. Kates, C. E. Colten, S. Laska, S. P. Leatherman, Reconstruction of New Orleans after Hurricane Katrina: A research perspective (2006) http://www.pnas.org/content/103/40/14653

FIGURE 3: PHASES OF RECOVERY FOLLOWING A DISASTER



Source: SGS Economics & Planning based on Kates (2006)

3.2 Townsville Floods (January 2019)

Overview of disaster

Between 27 January and 8 February 2019, monsoonal rainfall fell across 39 Local Government Areas (LGA) in Queensland, causing widespread flooding. The one in a hundred-year flood saw many parts of Queensland declared as disaster zones and forced thousands of residents to evacuate.

Townsville was at the epicentre of this downpour, with one year's worth of rain inundating the town over a few days. Townsville is classified as a flood area and has endured 20 major flood events since the 1860s.

The 2019 flooding is regarded as the worst natural disaster event to impact the region. During this weather event, a record high of 1,391 mm of rain was recorded at the Townsville Airport weather station.

Townsville's high risk of flood stems from being built on natural floodplains of the lower reaches of Bohle and Ross River (JBA, 2019). Hence, houses were typically built on low lying areas. The flood maps before this weather event identified that suburban areas, such as Oonoonba and Idalia, were not at risk during this flood. However, flooding occurred in these areas due to the sudden release of water from the Ross River Dam (The Australia, 2019).

The Ross River Dam (RRD) received 850,000 megalitres of rainfall. This equates to 3.8 times the dam's capacity, which was found through a hydrological analysis exceeding a one-in- 1,000-year event. The RRD capacity peaked at 43m at 247 per cent capacity, which required authorities to urgently discharge water from the dam into the Ross River at the rate of 1,900 m3/sec.

This large and quick expulsion of water inundated Townsville's suburban area with further damages. Figure 4 shows several areas that were affected by significant rainfall and flooding. There was significant damage particularly in Rosslea, Hermit Park and Idalia.

> *The 2019 Townsville flooding has been regarded as the worst natural disaster event to impact the region to-date.*

Health impacts

The Townsville flooding resulted in the loss of four lives, with two bodies discovered in floodwaters, and two lost from melioidosis. One has remained missing since this event transpired. In addition, there were at least ten people hospitalised due to a bacterial infection.

There were also further impacts that occurred beyond infrastructure damage. For example, it was estimated that 500,000 cattle perished in the floodwater. It was also noted that there was severe erosion on the banks of the Ross River, with structural damage to pathways and boardwalks. In one section of the pathway, the flooding caused the supporting rocks and concrete to cave under, which created a dangerous hazard for pedestrians.

This weather event required the assistance of multiple rescue and recovery agencies, including the State Emergency Service, Queensland Government, Townsville City Council, Queensland Rural Fire Service, Red Cross, Australian Defence Force and Disaster Relief Australia[5]. To assist emergency services, many locals volunteered in evacuating trapped residents from their flooded homes by boat.

Property damages

Regarded as one of Queensland's worst natural disasters, it has been estimated that 3,300 properties were damaged based on a post-event onsite study. 2,063 properties were classified with minor damage, 1,101 properties suffered moderate damage and the remaining 135 with severe damages. Of these 3,300 properties, approximately half were rendered uninhabitable[6]. A total of 30,000 insurance claims were filed, equating to an estimate of $1.3 billion of damages. Roughly 91 per cent of total claims were residential properties, with commercial claims making up the remainder 9 per cent.[5]

[5]Previously known as Team Rubicon Australia

[6]https://www.jbarisk.com/flood-services/event-response/a-retrospective-of-townsville-flooding/

DEFINING PROPERTY DAMAGE

Minor damage relates to broken windows, damaged fences, gutters, and carports. It can also include minor roof or water ingress failures.

Moderate damage relates to more significant roof or water ingress failures, minor structural issues which do not require temporary accommodation for the occupant.

Severe damage relates to roofing and other structural failures which means the occupant will need temporary accommodation.

FIGURE 4: TOWNSVILLE FLOOD-AFFECTED AREAS

Source: JBA Risk Management, 2019

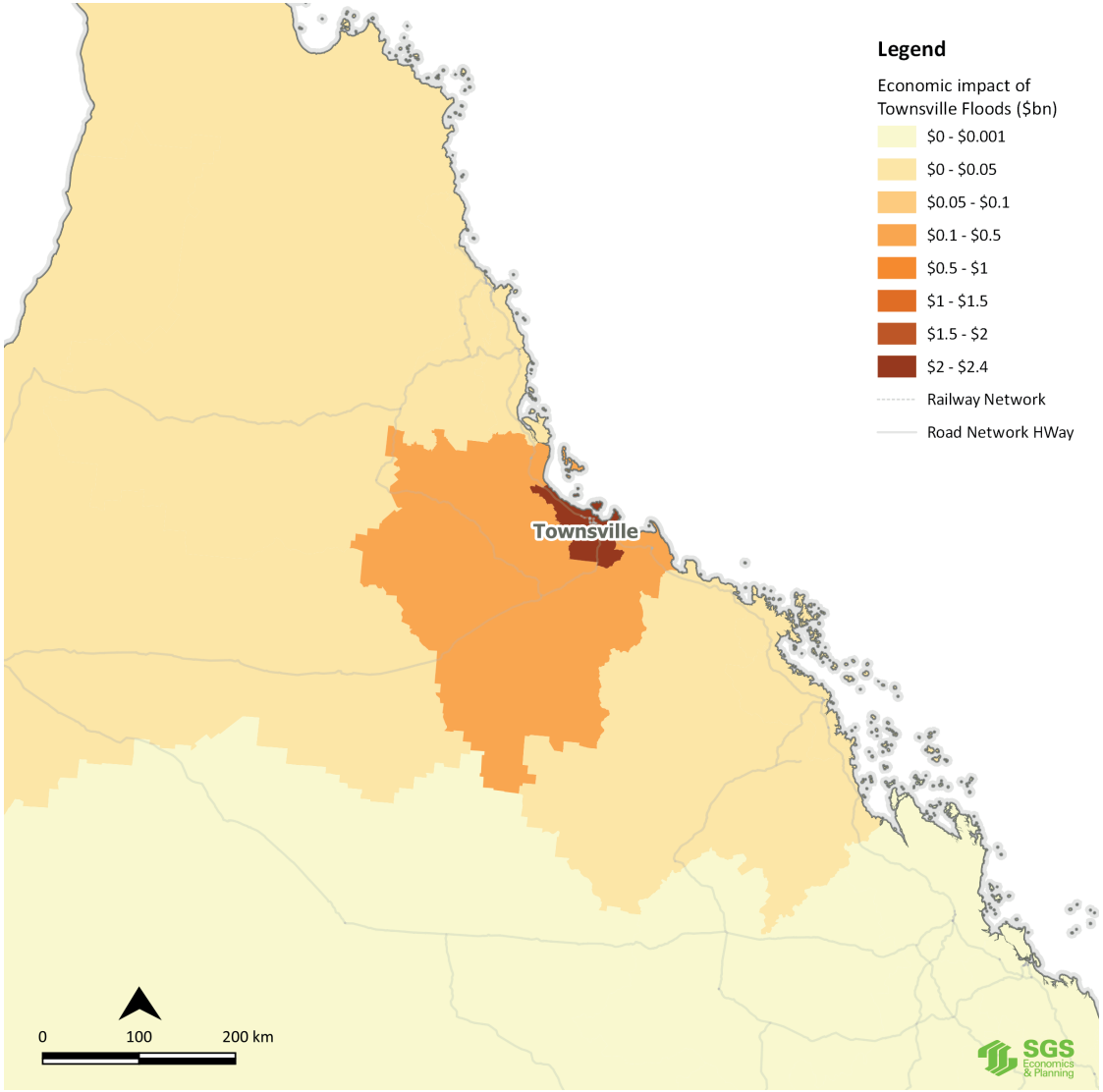
Economic impact of disaster

In 2019, the economic impact of the Townsville floods was estimated to be a $2.5 billion reduction in GDP. This represents a 0.8 per cent decrease in GDP of the areas impacted by the Townsville floods, including the regions surrounding Townsville such as Ayr, Charters Towers, Cairns, Whitsundays, Mackay and Outback QLD. This is the result of disruption to normal economic production, loss of crops and delayed mineral exports, transfer of household and business expenditure from other uses to disaster recovery and the loss of economic infrastructure.

The majority of this economic impact occurred in the Townsville urban area (SA3), where the economic impact amounted to a 20 per cent decrease in GDP in 2019. Figure 5 shows the economic impact of the Townsville floods by SA3, highlighting the impacts felt across QLD.

During 2019, total insurance claims and recovery activity boosted the economy (compared to a scenario of no insurance payments) of the areas impacted by the Townsville floods by $1.4 billion (see Figure 6). In the following year, as the stimulus of the payouts continue to flow through local economies, an additional $0.9 billion was added to GDP. This improved economic performance is expected to continue to at least 2021, with the economy being $0.6 billion higher because of the total insurance industry claims and recovery activity. The cumulative economic impact over three years from 2019 to 2021 is estimated to be $2.9 billion.

FIGURE 5: ECONOMIC IMPACT OF TOWNSVILLE FLOODS – GROSS DOMESTIC PRODUCT ($ BILLION)



Source: SGS Economics & Planning

Figure 7 compares Townsville's GDP under two scenarios, one showing the economic impact of the event on the local economy (event impact) and one showing the economic impact of insurance (insurance impact). This shows the sharp decline in GDP that would have occurred without insurance. With insurance payouts the decline in GDP was lessened and the economy is expected to return to the long term trend by 2021/22.

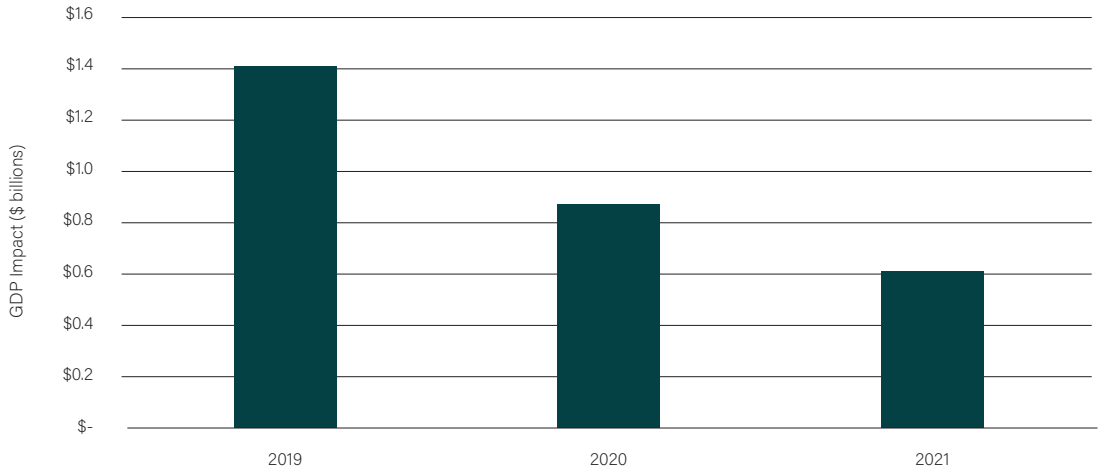
While the economy does recover (unaffected businesses re-open, infrastructure is repaired, government assistance stimulates) without insurance there is a long term impact on the economy. Even three years after the event, the Townsville economy would be 7 per cent ($830 million) smaller without insurance which is effectively a permanent decline in the productive capacity of the city. This decline would be because of businesses not re-opening without the help of insurance payouts and a loss of population as people leave the area due to property damage and loss of employment opportunities.

In addition to the insurance payouts there was also considerable government support following the floods, including:

- Small Business Disaster Recovery Grants of up to $10,000 to assist in recovery
- Restocking, Replanting and On-farm Infrastructure Grants of up to $400,000 for primary producers
- Disaster Recovery Payment (one off payment of $1,000 for adults and $600 for children)

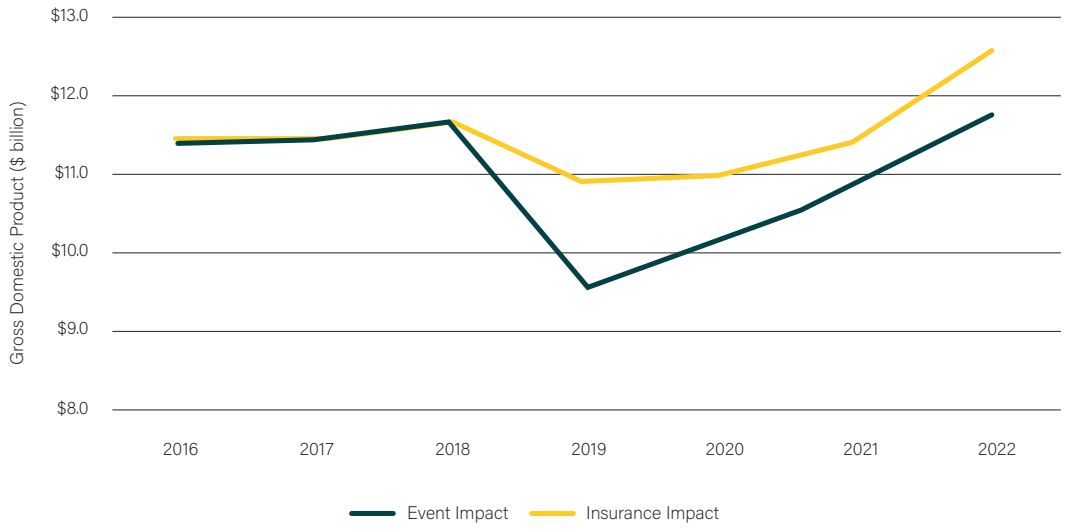
These payments were in addition to the normal spending on repairing damaged infrastructure following the floods.

FIGURE 6: ECONOMIC BENEFIT OF INSURANCE FROM THE TOWNSVILLE FLOODS



Source: SGS Economics & Planning

FIGURE 7: ECONOMIC IMPACT OF TOWNSVILLE FLOODS ON GDP – TOWNSVILLE SA3



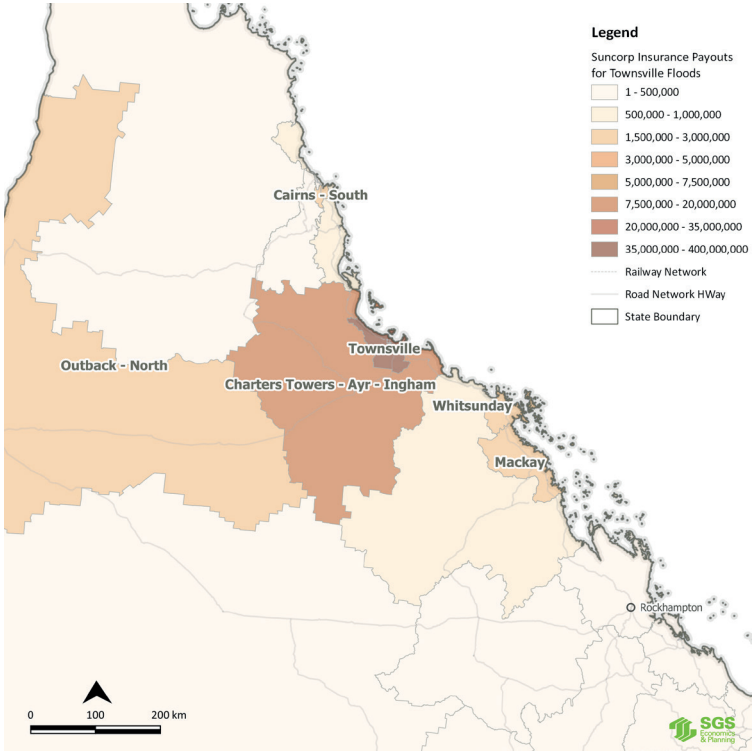
Source: SGS Economics & Planning

Impact of Suncorp insurance

Suncorp Group's insurance brands played a substantial role in assisting the process of economic recovery in the aftermath of the Townsville floods. Figure 8 below shows the spatial distribution of Suncorp's insurance claims and recovery activity following the disaster.

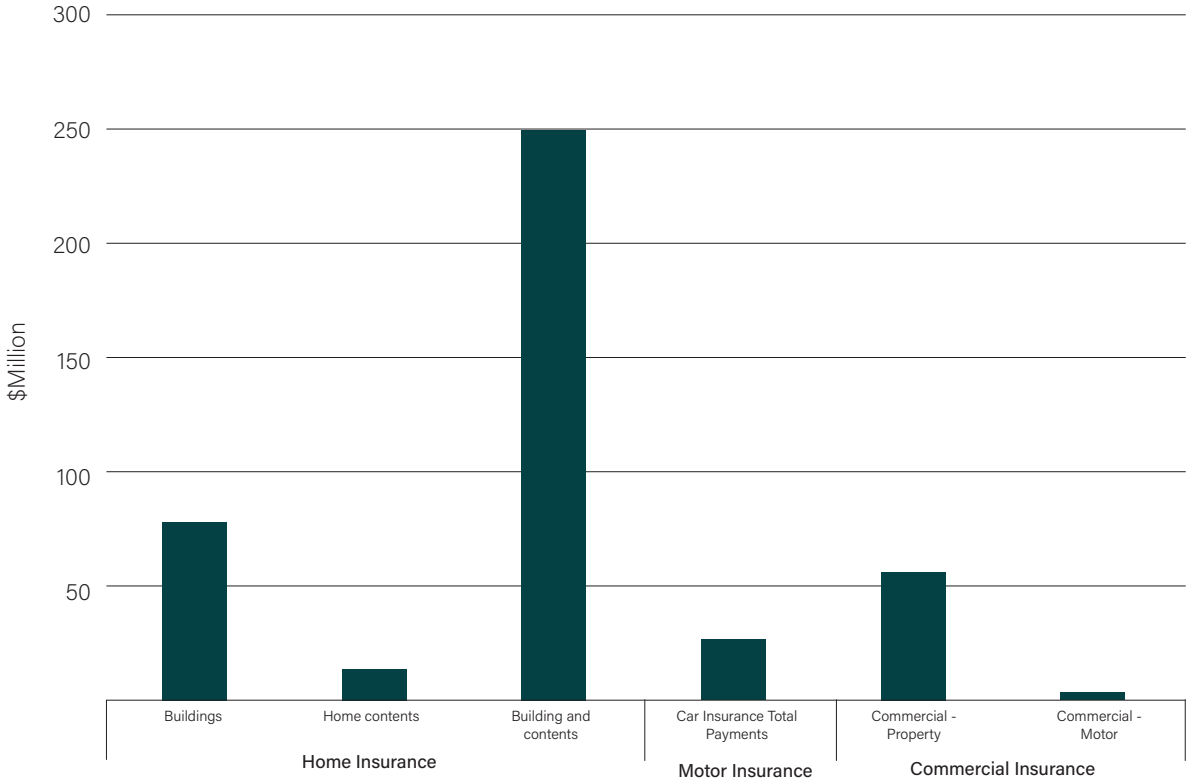
In total, Suncorp Group's insurance brands paid over $424 million in insurance claims, with household insurance claims accounting for 80 per cent of the total ($339 million). Commercial claims amounted to $58 million (14 per cent of the total) and motor insurance claims amounting to $25 million (6 per cent of the total) (see Figure 9).

FIGURE 8: MAP OF SUNCORP CLAIMS & RECOVERY ACTIVITY – TOWNSVILLE FLOODS



Source: Suncorp

FIGURE 9: SUNCORP CLAIMS & RECOVERY ACTIVITY – TOWNSVILLE FLOODS

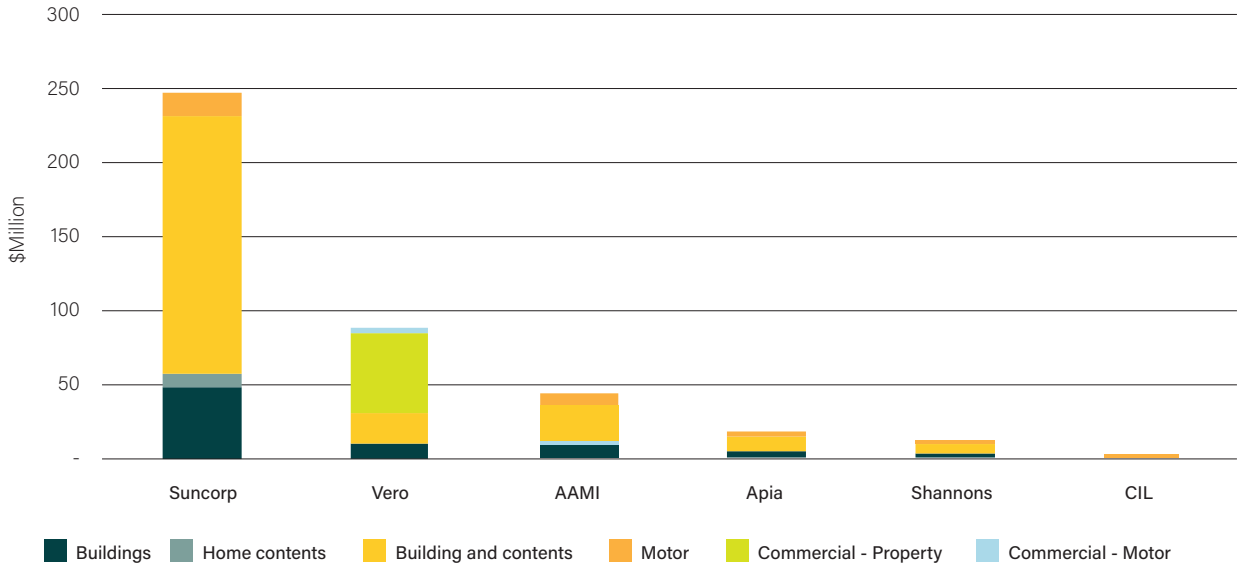


Source: Suncorp

Figure 10 presents the breakdown of payouts for the Townsville floods by the major Suncorp brands. Suncorp Insurance accounted for almost 60 per cent of total payouts. The majority of Suncorp's payments were building and home contents related, while Vero Insurance policies focused on commercial property insurance. Other Suncorp brands with significant payouts for the Townsville Floods included AAMI, Vero, APIA, and Shannons. These payouts were largely for building and home contents insurance.

These claims and recovery activity resulted in the repair and reconstruction of homes, buildings and infrastructure, allowing the economy to recover towards pre-flood levels.

FIGURE 10: SUNCORP CLAIMS & RECOVERY ACTIVITY BY BRAND – TOWNSVILLE FLOODS



Source: Suncorp

CUSTOMER CASE STUDY

Townsville Floods | Suncorp Customer

Suncorp customer Darrel Sard lives in Idalia, Townsville and during the monsoonal rains in February 2019 Darrel's home was inundated with approximately 60cms of flood water. The damage to the home was extensive and resulted in the interior of the home needing to be completely stripped out and rebuilt.

Using his policy's temporary accommodation feature Darrel secured accommodation close to his home allowing key decisions on flooring, wall tiles and cabinetry to be made quickly and easily. Darrel was able to refurnish his home from local retailers, purchasing then storing key items while the house was repaired and quickly moving them in when work was completed. This ensured the insurance benefit provided by Suncorp supported the local economy which had also been severely impacted by the floods.

Suncorp was able to restore Darrel's home to a high quality and standard because he had the correct level of coverage on the Suncorp home policy. Darrel unfortunately knows others in the community were not as fortunate and has become a keen advocate for understanding the level of cover you need and the importance of preparing your home ahead of storm season.

3.3 Black Summer bushfires (December – January 2020)

Overview of disaster

The 2019-2020 Australian bushfire season was a period of unprecedented and intense bushfires across large parts of Australia. The bushfire season started in September 2019 and by March 2020, the Black Summer fires burnt almost 19 million hectares, destroyed over 3,000 houses and killed 33 people. The bushfire season peaked during December 2019 to January 2020. The effects were irreversible in its destruction across large areas of the country.

The mega-fires that occurred in NSW burnt through the largest area of any fire season within the last 20 years.

One of these fires was categorised as the largest forest fire in Australia's history. Victoria had the highest number of fires, area burned, and the second-highest number of houses lost during the fire season. South Australia lost the highest number of houses in the last two decades. Not only did the bushfires impact Australia, but it confronted the world with the accelerating danger of climate change with the smoke travelling to other countries and continents. This signalled significant concerns from the effects of more frequent and intense bushfires in the future, not only for Australia but globally.

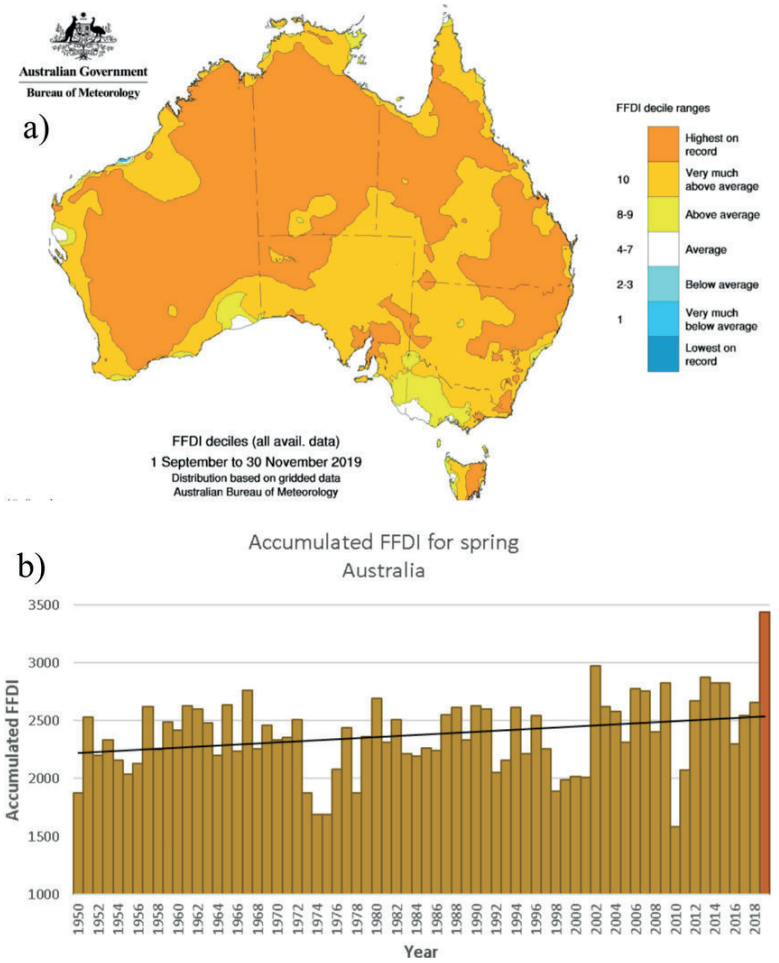
2019 was classified as Australia's warmest year on record. It broke records of the average mean temperature and the mean maximum temperatures.

Spring was also the driest spring in Australia's record and the fifth warmest. Overall rainfall measured at 277.6mm for the annual mean. Low rainfall coupled with record high temperatures, contributed to an accelerated rate of evaporation which further diminished available water. Across large areas of Australia, the low rainfall produced low moisture soil. A very strong positive Indian Ocean Dipole was the major contributor to the very low rainfall and low humidity environment experienced throughout Australia in 2019.

> *The Black Summer bushfires peaked during December 2019 to January 2020, causing irreversible destruction across large areas of the country.*

In June 2019, the Queensland Fire and Emergency Service alerted a potential early start to the bushfire season which normally starts in August. By spring, 95 per cent of Australia had a Forest Fire Danger Index (FFDI) that was much higher than average. 60 per cent of the country showed a record high, which indicated a high risk of fire danger in Australia's forests. A combination of high temperature, rainfall deficits and prolonged drought increased fuel availability which triggered a series of bushfires around Australia.

FIGURE 11: BLACK SUMMER FOREST FIRE DANGER INDEX (FFDI) LEVELS



Source: Filkov & et al, 2020

FIGURE 12: FIRE STATISTICS FROM BLACK SUMMER BUSHFIRES

State	Burned area, ha	Number of fires	Houses lost	Lives lost
VIC	1,505,004	3,500	396	5
NSW	5,595,739	10,520[1]	2,475	25
QLD	2,500,000	NA	48	0
TAS	36,000	NA	2	0
WA	2,200,000	NA	1	0
SA	286,845[2]	1324	186	3
NT	6,800,000	NA	5	0
ACT	60,000	NA	0	0
Total	**18,983,588**	**15,344**	**3113**	**33**

NA- data is not available

Source: Filkov & et al, 2020

State impacts

New South Wales had the most amount of disruptions from the bushfires. There was a total of 10,520 fires across the state, burning a total of 5.5 million hectares, with 2,475 houses and 25 lives lost. Two mega-blazes were created in NSW, which included the Gosper Mountain fire and fires on the NSW and Victoria border. The Gosper Mountain fires burnt through approximately 512,626 hectares of land and were recorded as one of the largest fires in Australia's history. The second mega-fire burned through 895,744 hectares and was created by three fires on the border of NSW and Victoria.

Sydney was also affected indirectly by the bushfires. There were 81 days of poor or hazardous air quality in 2019. From the shutdowns and the disruptions caused by the smoke, Sydney lost approximately $12-$50 million of GDP each day[7].

In Victoria, there was a total of 3,500 fires recorded during the Black Summer bushfires which contributed to 1.5 million hectares of land burnt, 396 houses and five lives lost.

The most destructive fire was the Mallacoota fire which transpired from a small fire 30km east of town on 29 December. Mallacoota is known as an iconic tourist destination and, by Christmas, the regular population of 1,000 residents increased by 8-fold. Emergency Management Victoria announced that it was too late for the 4,000 tourists and residents to evacuate on 30 December. By the 31st, the fire was burning the outskirts of Mallacoota. On 2 January, Victoria declared a state of disaster for the first time in history. The roads to Mallacoota were blocked for over a month due to bushfires and fallen trees, which required the people to be evacuated on naval vessels. There were at least 300 homes lost to these fires.

South Australia had a series of 1,324 bushfires that saw 286,845 hectares of land burnt, 186 homes and three lives lost. The worst bushfires started from a succession of lightning strikes. Three days after the fires were announced as contained, a further cycle of lightning caused additional fires. This merged with existing fires and created the catastrophic Kangaroo Island Fires.

The Kangaroo Island fires burned for more than three weeks and burnt more than 210,000 hectares. There was a significant loss of livestock and the fires burnt between $100-900 million worth of plantation timber. This resulted in the loss of 89 homes and hundreds of buildings, most with links to tourism such as the world-renowned Southern Ocean Lodge. The Adelaide Hills fires also destroyed valuable infrastructure and stock. These fires burnt through world- famous viticulture and winery areas and reached the capital city.

Health and biodiversity impacts

The bushfires created an array of detrimental impacts, including on health. The Global Fire Emissions Database estimated that the bushfires contributed to 900 million metric tons of carbon dioxide. The bushfire smoke was responsible for 417 deaths, 1,124 hospitalisations for cardiovascular problems, 2,027 respiratory problems and 1,305 for asthma (Arriagada as cited in Filkov, 2020). Canberra had the worst air quality in the world during the height of the bushfires. In Sydney particulate matter was four-times higher than the World Health Organisation (WHO) guidelines which created toxic air quality for most of the city.

The fires killed over one billion animals according to conservative estimates from the University of Sydney's Chris Dickman (as cited in Filkov, 2020). These figures did not include the loss of invertebrates, such as frogs and insects. There are concerns that some of these endangered species may be driven to extinction. In an intense fire, the risk of animals surviving is low when an entire area is destroyed. There is also a whole array of on-going mortality issues post-fires, not separate to starvation, lack of shelter and attacks from predators. It was estimated that half of the koala population and a quarter of Ligurian honeybees on Kangaroo Island had been killed.

The impacts from the Black Summer fires are irreversible; It will take many years to restore the economy, infrastructure, animal and vegetation biodiversity.

[7]https://www.smh.com.au/national/nsw/the-economic-cost-of-bushfires-on-sydney-revealed-up-to-50-million-a-day-and- rising-20191212-p53jbq.html

Economic impact of disaster

The total economic impact of the Black Summer bushfires was estimated to be a $4.6 billion reduction in GDP. This represents a 1.8 per cent decrease in GDP of the areas impacted by the bushfire. The effect on local economies varied across the state, with greater impacts felt in eastern Victoria and southern NSW.

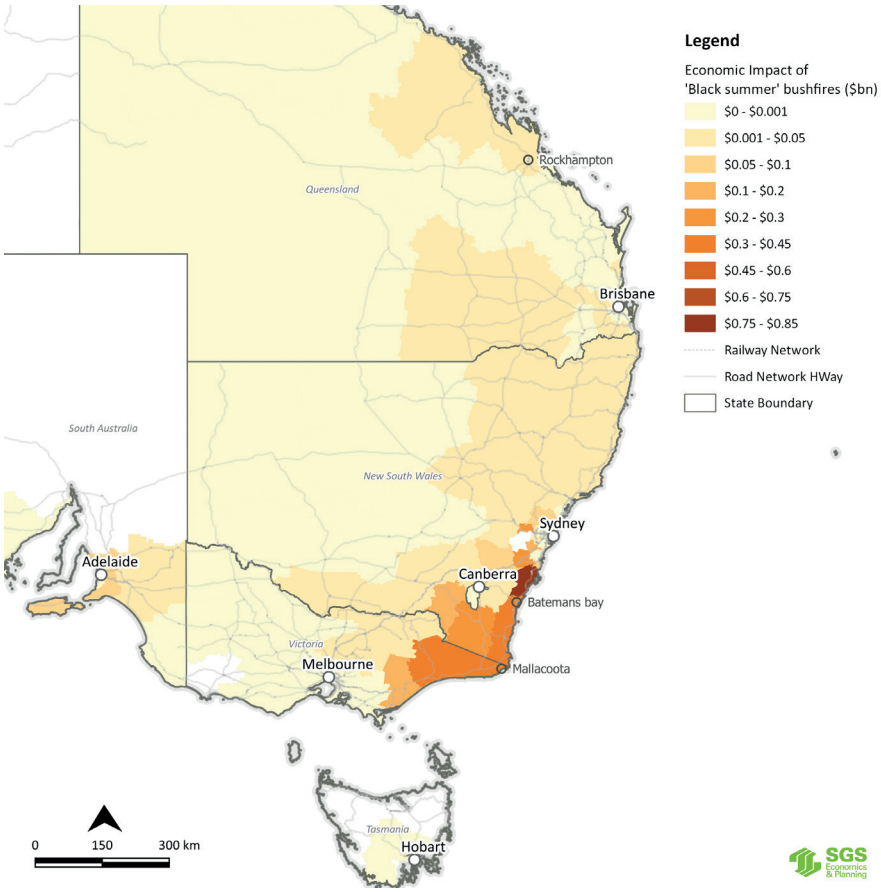
During 2020, total insurance claims and recovery activity boosted the economy (compared to a scenario of no insurance payments) of the areas impacted by the summer bushfires by $1.2 billion (see Figure 14).

The impact of COVID-19 has meant that some of the disaster recovery had been slower than usual. This has meant that some bushfire affected areas are still within the recovery and reconstruction phase despite almost a year passing since the start of the bushfire period.

The economic modelling has assumed that future GDP growth will return to normal trend levels in 2021. This simplifying assumption means that the economic benefits of insurance might be understated. For example, the East Gippsland tourism sector has been impacted due to COVID-19 restrictions and hence insurance payouts in this area could have an even greater multiplier effect.

In 2021, as the stimulus of the payouts continue to flow through local economies, an additional $1.2 billion is expected to be added to GDP. This improved economic performance from the insurance payouts flowing through the local economy is expected to continue in 2022 at a lower level. The cumulative economic impact over three years is estimated to be $2.5 billion, which has helped the local economies affected by the bushfires to reduce the severity of the economic impacts from such a large-scale disaster.

FIGURE 13: ECONOMIC IMPACT OF BUSHFIRES – GROSS DOMESTIC PRODUCT ($ BILLION)



Source: SGS Economics & Planning

The scale of the bushfires varied across Australia, with not only the level of damage varying but also the scale of the economic impact. These variations are due to the range in severity of the disaster and the varying characteristics of the regions.

Regional and remote communities more severely impacted by the bushfires have a different recovery profile to more urban and peri-urban areas. Three regional examples are provided below for East Gippsland in Victoria, Shoalhaven in NSW (regions include Nowra and Jervis Bay) and South Coast in NSW (regions in Batemans Bay to Merimbula).

The economic impact of the disaster is more pronounced in locations where key economic assets were destroyed by the disaster. The East Gippsland SA3, which includes the towns of Mallacoota and Lakes Entrance, was one of the hardest-hit regions. Much of its road network connecting to other regions, and the tourism infrastructure on which its economy relies, was destroyed.

Figure 15 compares East Gippsland's GDP under two scenarios, one showing the economic impact of the event on the local economy (event impact) and one showing the economic impact of insurance (insurance impact). This shows the sharp decline in GDP from the impact of the disaster that would have occurred without insurance.

With insurance payouts the decline in GDP was lessened to a degree. However the economy still experienced a sharp decline and is expected to return to its long-term trend by 2021/22. Without insurance the East Gippsland economy would not have returned to stable levels for several more years.

Even three years after the event, the economy of East Gippsland would be 4 per cent (almost $100 million) smaller without insurance – which is effectively a permanent decline in the productive capacity of the region.

The decline would be because of businesses not re-opening without the help of insurance payouts and a loss of population as people leave the area due to property damage and loss of employment opportunities.

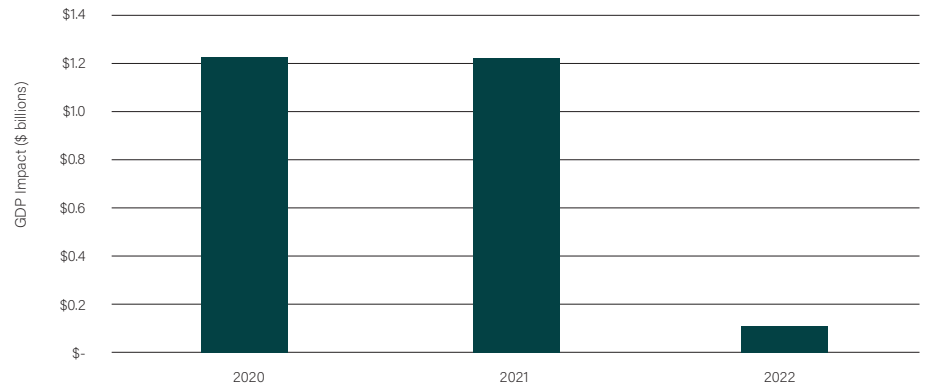
This is often the situation for regional areas which have a narrower economic base (often dominated by capital intensive sectors like resources and agriculture) and more limited employment opportunities compared to larger urban areas. As such, insurance plays a more significant role in mitigating adverse outcomes and helping to restore normal economic activities.

The Shoalhaven and South Coast regions in NSW experienced damage from the summer bushfires and received a significant amount of insurance payouts for building and home contents damage. Figure 16 and Figure 17 show the two scenarios of GDP impacts, one showing the economic impact of the event on the local economy and one showing the economic impact of insurance for each region (SA3).

The Shoalhaven region experienced a decline in GDP from the event, which the insurance stimulus helped to lessen in 2020 and returned the economy back to its long term trend by 2021.

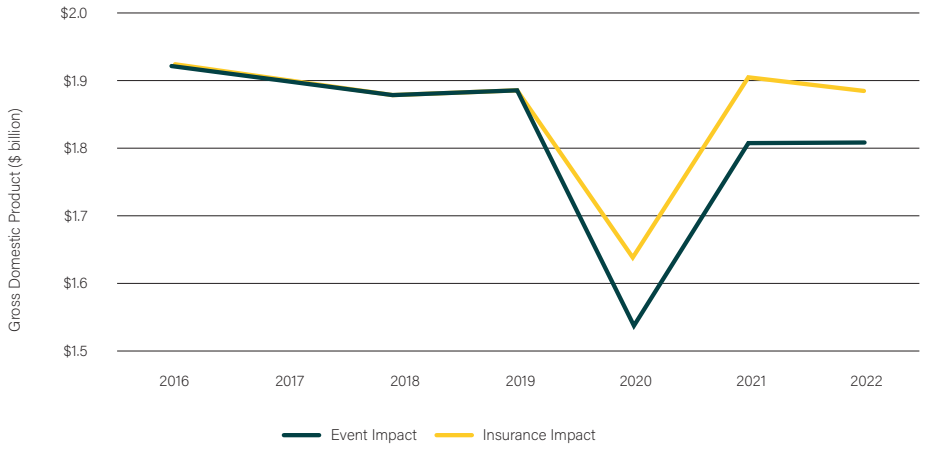
The South Coast region experienced a decline in GDP from the economic impacts of the event, however the insurance stimulus helped the economy to remain stable in 2020 and continue to grow in 2021.

FIGURE 14: ECONOMIC BENEFIT OF INSURANCE FROM THE BUSHFIRES



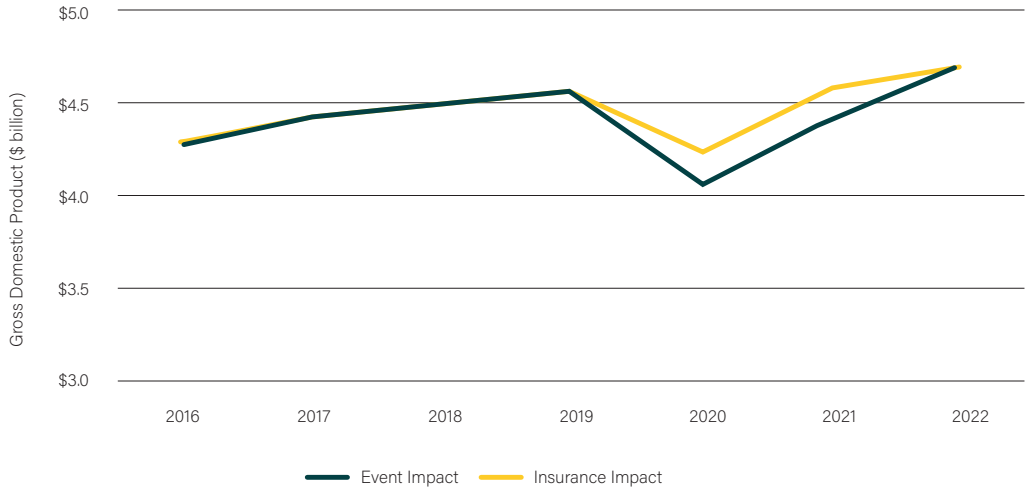
Source: SGS Economics & Planning

FIGURE 15: ECONOMIC IMPACT OF BUSHFIRES ON EAST GIPPSLAND GDP ($ BILLION)



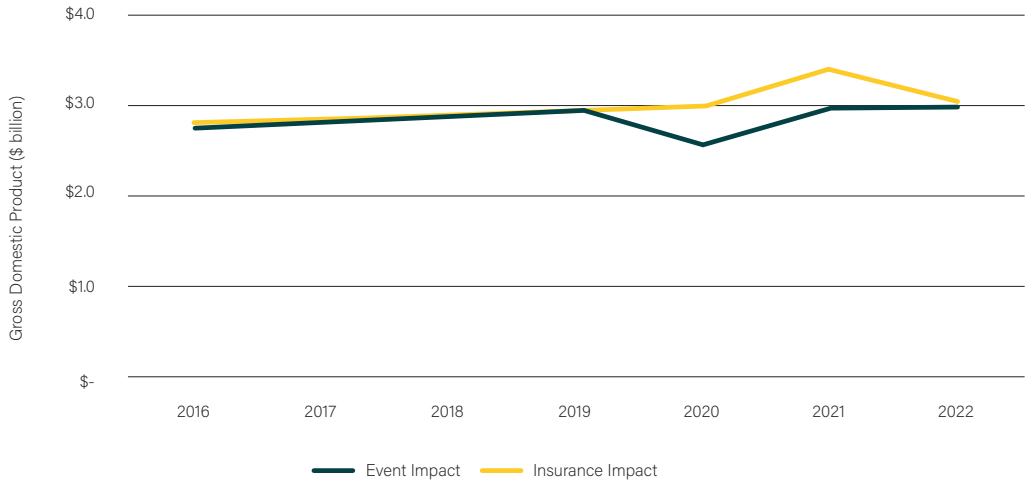
Source: SGS Economics & Planning

FIGURE 16: ECONOMIC IMPACT OF BUSHFIRES ON SHOALHAVEN GDP ($ BILLION)



Source: SGS Economics & Planning

FIGURE 17: ECONOMIC IMPACT OF BUSHFIRES ON SOUTH COAST GDP ($ BILLION)



Source: SGS Economics & Planning

Impact of Suncorp insurance

As a result of the bushfires, Suncorp's insurance brands paid out $244 million in insurance claims and recovery activity. Home insurance claims account for 88 per cent of all claims ($215 million), commercial insurance claims amounted to $23 million (10 per cent of total) and motor insurance claims amounted to $6 million (2 per cent of total).

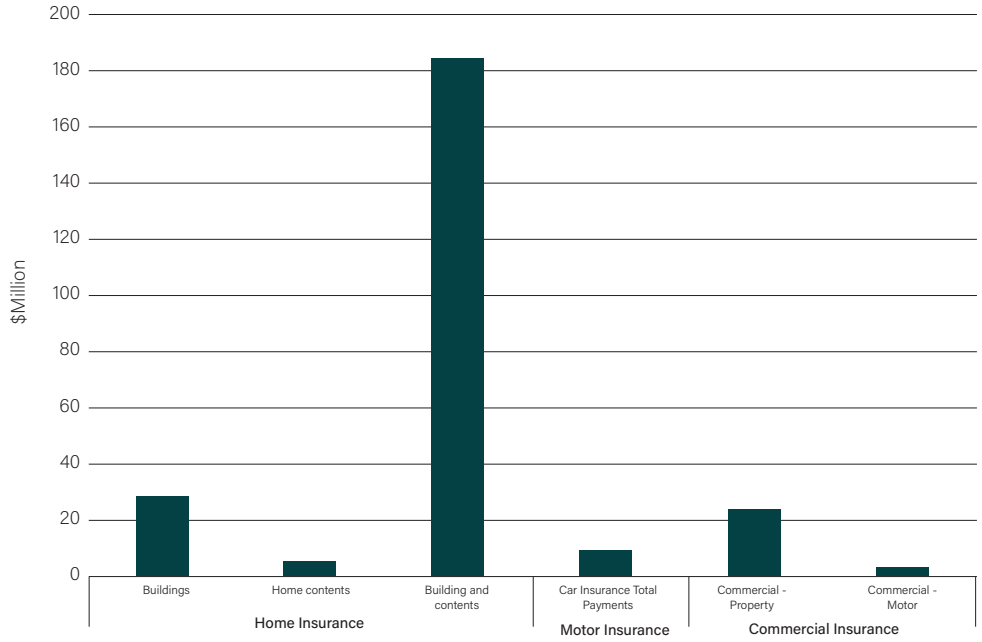
Figure 19 presents the breakdown of payouts for the bushfires by the Suncorp brands. The three largest brands in terms of payouts for the bushfires were AAMI (31 per cent of total), GIO (21 per cent of total) and Apia (15 per cent of total). The majority of payments from these brands were building and home contents related.

Other Suncorp brands with significant payouts for the bushfires included Vero, Shannons and Suncorp Insurance. These payouts were largely for building and home contents insurance.

The claims and recovery activity resulted in the repair and reconstruction of homes, buildings and infrastructure, allowing the economy to recover towards pre-bushfire levels.

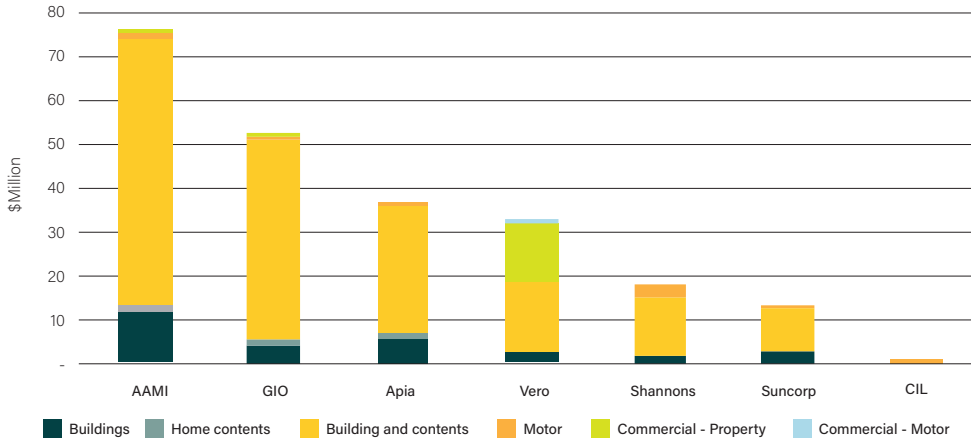
Suncorp's insurance brands played a substantial role in assisting the process of economic recovery in the aftermath of the bushfires. Figure 20 and 21 show the spatial distribution of Suncorp's insurance claims and recovery activity following the disaster.

FIGURE 18: SUNCORP CLAIMS & RECOVERY ACTIVITY – BUSHFIRES



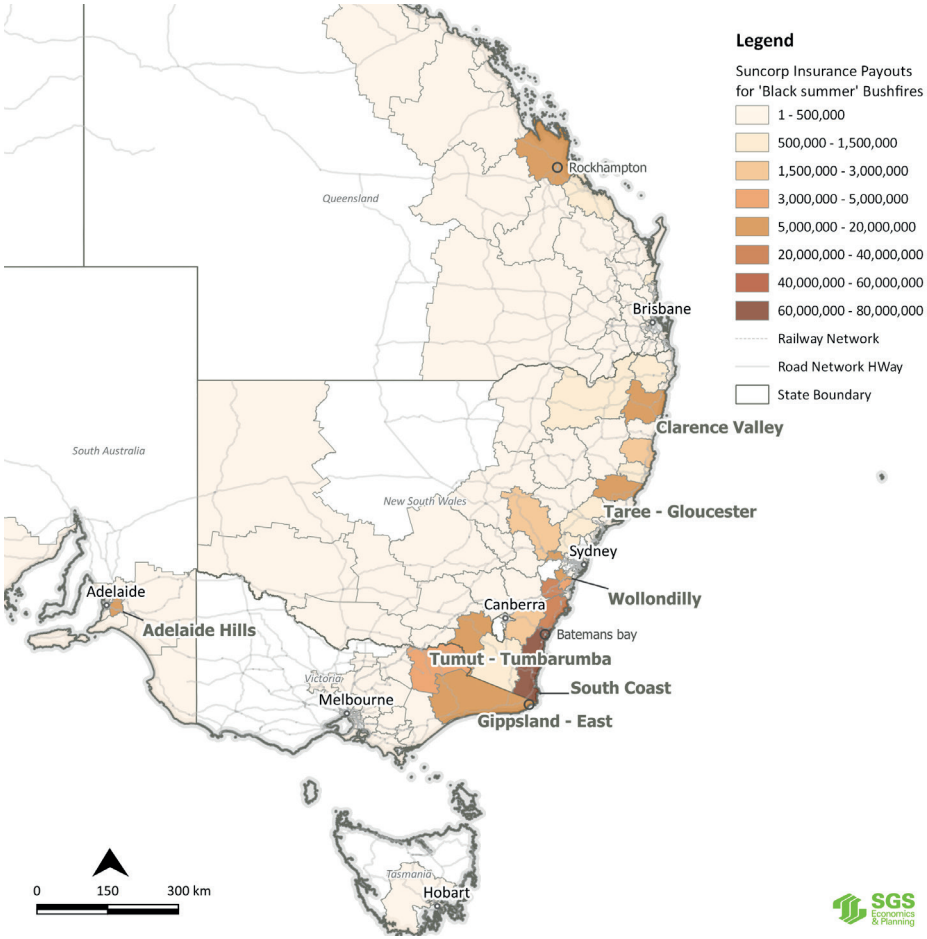
Source: Suncorp

FIGURE 19: SUNCORP CLAIMS & RECOVERY ACTIVITY BY BRAND – BUSHFIRES



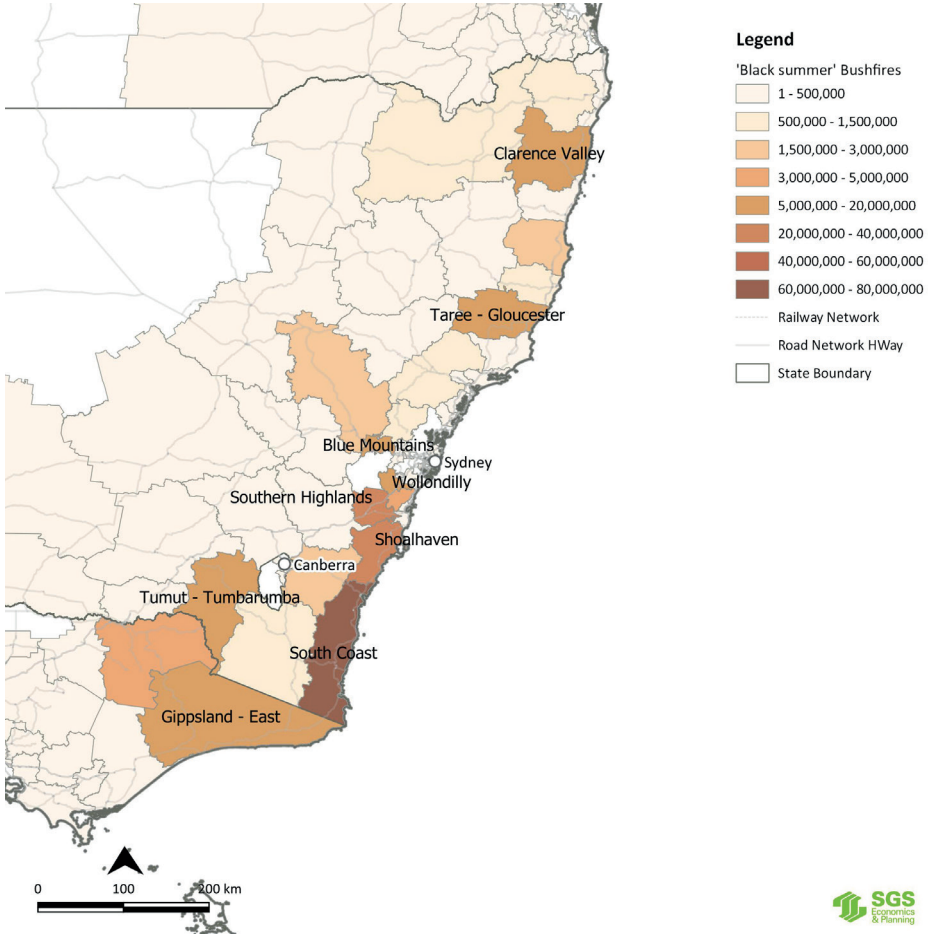
Source: Suncorp

FIGURE 20: MAP OF SUNCORP CLAIMS & RECOVERY ACTIVITY – BUSHFIRES



Source: Suncorp

FIGURE 21: MAP OF SUNCORP CLAIMS & RECOVERY ACTIVITY – BUSHFIRES – NSW SOUTH COAST



Source: Suncorp

CUSTOMER CASE STUDY

Bushfires | Vero Customer

On December 31, 2019, bushfires swept through Malua Bay, on the South Coast of New South Wales, destroying businesses and homes in the idyllic coastal region.

The Malua Bay bowls clubhouse was caught up in the destruction being completely destroyed, yet remarkably the bowling greens were left largely untouched.

This allowed the 4,000 strong members of the club to be back on the greens less than a week after the fires, reigniting the spirit of the community.

The bowls club was insured with Vero. Vero secured partner builders using local trades to construct a temporary clubhouse while the new facility is being built to provide the community with a safe meeting place to come together and connect.

"We're all just getting back to normal, and trying to move on, put the past behind us and focus on the future now. Most members have been here for years," she said. "It's not just a club that we're running, it's a home for people. Without them we wouldn't be a club."

Christine Howarth - Club Manager, Malua Bay Bowls Club

"This bowls club is like a second home to the members. There's about 4,000 in total, so while it is a bowls club, it is very much a place for the community as well. Bowls is a part of it, of course, but it is only a part of it. It's a strong community."

Peter Hutchinson - VP Men's Bowls, Malua Bay Bowls Club

3.4 East Coast Hailstorms (multiple states) (January 2020)

Overview of disaster

On 19 January 2020, storms raged through the East Coast of Australia. This storm continued for three days until 21 January and wreaked destruction in Victoria, New South Wales, Queensland and the Australian Capital Territory. The conditions were made worse with the timing coinciding with the Black Summer bushfires. The volatile weather events brought thunderstorms and giant hail across parts of Australia that were already experiencing drought apocalyptic dust storms.

The January 2020 hailstorms were brought on by a large-scale weather pattern, which was the result of a broad low-pressure system which carried warm and moist air from Queensland's Coral Sea down to Victoria. This mixed with cooler upper-level temperatures provided unstable conditions for multiple thunderstorm cells to be formed.

Particularly for Canberra, it allowed for very dangerous "supercell" thunderstorms. Reported by PERILS (as cited in Insurance Journal, 2020), the January 2020 hailstorms is likely to rank as the fourth largest hail event in Australia for the past 20 years, surpassing the Brisbane November 2014 hailstorms, and the Sydney December 2018 hailstorms. This report noted that these weather events had an unusual set-up based on its national scale.

Typically, South-East Queensland and northern New South Wales are regarded as Australia's giant hail hot-spots and usually experience one to two severe hailstorms per region per year. In Canberra, hailstorms occur approximately once in every five years. The PERILS report regarded the storms in Canberra as more than a run-of-the-mill storm, noting that they were significantly severe.

State impacts

Storms hit Victoria on 19 January with hail the size of golf balls in some parts of the state. Intense weather put a pause on firefighting efforts in fire-ravaging zones, such as north-east Victoria and East Gippsland, with concerns of flash flooding. The eastern suburbs including Glen Iris, Warrandyte, Malvern East and Templestowe were the worst hit. There was a rush of calls to Victoria State Emergency Service with more than 1,300 people asking for assistance.

In the ACT, ACT emergency services received over 2,000 calls for assistance when the storm hit on January 20. It took out power for over 1,000 homes across the territory. The storm was declared a catastrophe by the Insurance Council of Australia. In the Parliamentary Triangle, hundreds of animals perished, including 300 protected flying foxes. Winds reached a peak of 117 km/h coupled with golf ball-sized hail destroying buildings and cars.

Two tourists were hospitalised after being injured by lightning. There were over 50,000 insurance claims lodged for ACT alone, costing more than $500 million. It also destroyed years of research, severely damaging 65 CSIRO experimental greenhouses and damaging the Australian Academy of Science's Shine Dome.

The storm travelled north bringing thunderstorms and bad weather to Sydney and then onto Queensland. Hailstones battering the outer suburbs were recorded at 4.3 cm. The strong winds damaged cars in the Sutherland area in Sydney. Across the southern-east part of Queensland, the storm brought down power to 20,000 homes and businesses. It forced two train lines out of action during peak-hour as the storm battered the state.

There have been over 125,000 insurance claims lodged, equating to a total insurance cost of $1.6 billion[8]. Figure 22 shows the breakdown of the claims by the top states. Most of the damage occurred in Australia's south-east, particularly in the ACT and Victoria.

> *The January 2020 hailstorms is likely to rank as the fourth largest hail event in Australia for the past 20 years.*

[8]ICA Data https://www.insurancecouncil.com.au/media_release/plain/575

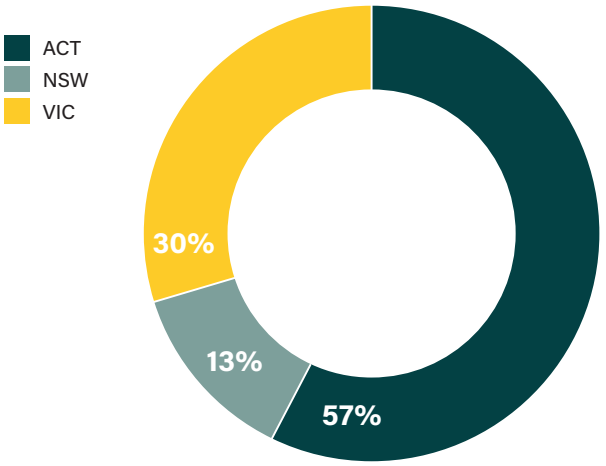
Economic impact of disaster

The total economic impact of the East Coast hailstorms was estimated to be a $1.7 billion reduction in local GDP. Areas that were hardest hit by the hailstorms included ACT, south east Melbourne and southern QLD. The hailstorms were a quick and targeted event which had severe impacts on a small number of regions, rather than a more widespread event such as the bushfires.

Therefore, the flow on economic impacts were not as severe as the bushfire and flooding events, and local economies were not as heavily impacted.

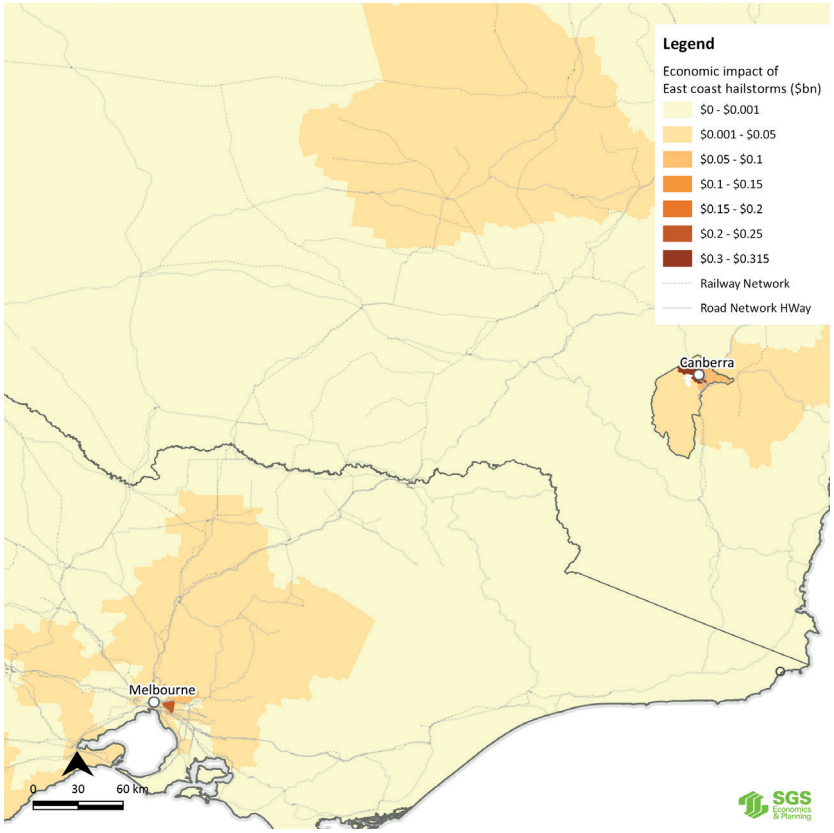
The maps below highlight the distribution of the economic impacts across the east coast of Australia.

FIGURE 22: BREAKDOWN OF TOTAL INSURANCE CLAIMS BY STATE



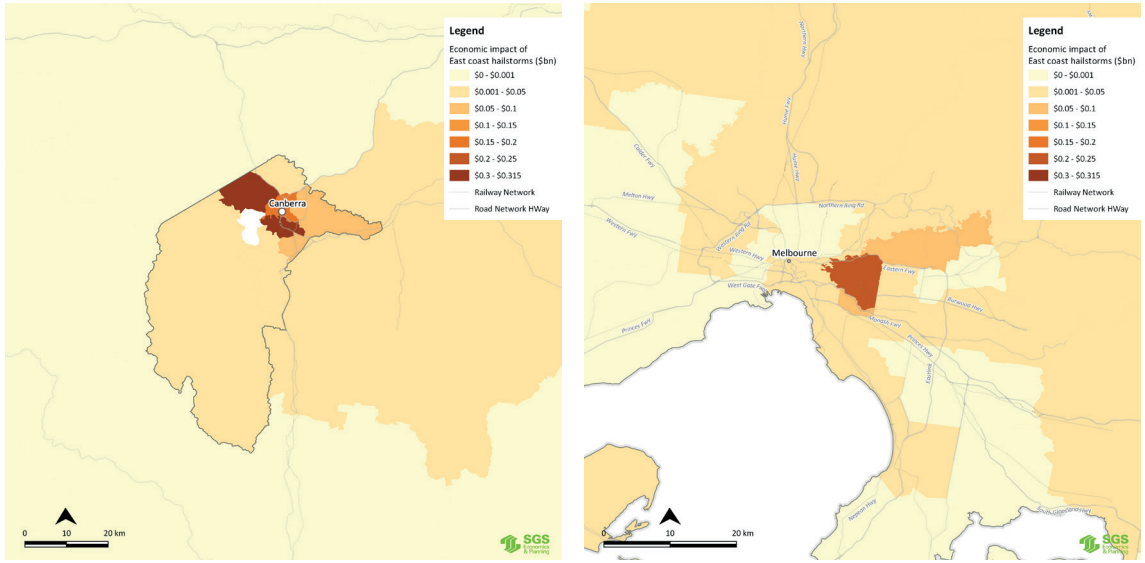
Source: Disaster.org, 2019

FIGURE 23: ECONOMIC IMPACT OF HAILSTORMS – GDP ($ BILLION)



Source: SGS Economics & Planning

FIGURE 24: ECONOMIC IMPACT OF HAILSTORMS – GDP ($ BILLION) – ACT AND MELBOURNE



Source: SGS Economics & Planning

During 2020, the payouts for claims and recovery activity by the Insurance industry have boosted the economy of the impacted areas by $1.4 billion, compared to a scenario of no insurance payments. The majority of insurance payouts from the hailstorms was for motor insurance and property damages, which assisted individuals and businesses affected by the hailstorms.

Impact of Suncorp insurance

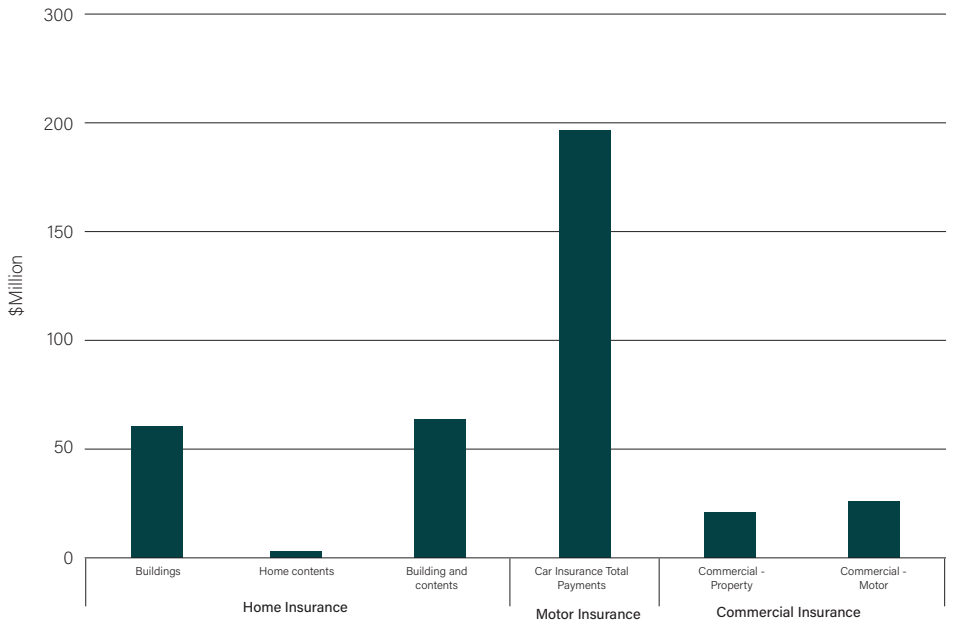
As a result of the hailstorms, Suncorp's insurance brands paid out $371 million in insurance claims and recovery activity. Motor insurance claims account for over half of all claims ($196 million), home insurance claims amounted to $127 million (34 per cent of total) and commercial insurance claims amounted to $47 million (13 per cent of total).

Figure 26 presents the breakdown of payouts for the hailstorms by the Suncorp brands. AAMI paid out almost half of total payouts for the hailstorm events. Two thirds of payouts from AAMI were for motor insurance, with the remaining for buildings and contents insurance.

Vero Insurance policies paid out 13 per cent of the total for hailstorm claims on commercial property and motor insurance. Other Suncorp brands with significant payouts for the hailstorms included GIO, Suncorp Insurance, APIA, Shannons and Bingle. These payouts were largely for motor insurance.

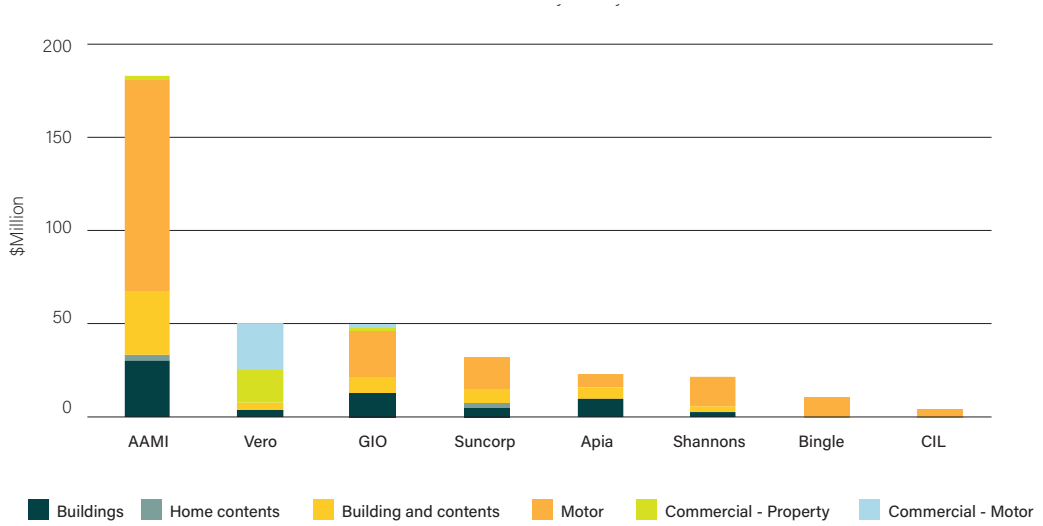
Suncorp played a substantial role in assisting the process of economic recovery in the aftermath of the hailstorms. Figure 27, 28 and 29 show the spatial distribution of Suncorp's insurance brands claims and recovery activity following the disaster.

FIGURE 25: SUNCORP CLAIMS & RECOVERY ACTIVITY – HAILSTORMS



Source: Suncorp

FIGURE 26: SUNCORP CLAIMS & RECOVERY ACTIVITY BY BRAND – HAILSTORMS



Source: Suncorp

CUSTOMER CASE STUDY

Storm and Hail | AAMI Customer

During January 2020 several communities were hit with severe storms and hail. The storms left behind a path of destruction particularly in Glen Iris, Victoria.

AAMI customers Scott and Fiona live in Glen Iris and their home sustained significant hail damage with damaged roof tiles, smashed windows and water entering the property damaging plaster and paintwork of their heritage listed home.

AAMI's builders worked with the couple's preferred local builders to arrange the repairs. The builders were able to return the property back to its proud heritage glory.

"Trust was key in delivering this outcome and I am grateful for the way that all the parties worked together in support of us."

"Many thanks for Suncorp's attention over the last eight months. We are so pleased to have our home looking spot on again."

- Fiona Reinke, homeowner

FIGURE 27: MAP OF SUNCORP CLAIMS & RECOVERY ACTIVITY – HAILSTORMS, VICTORIA

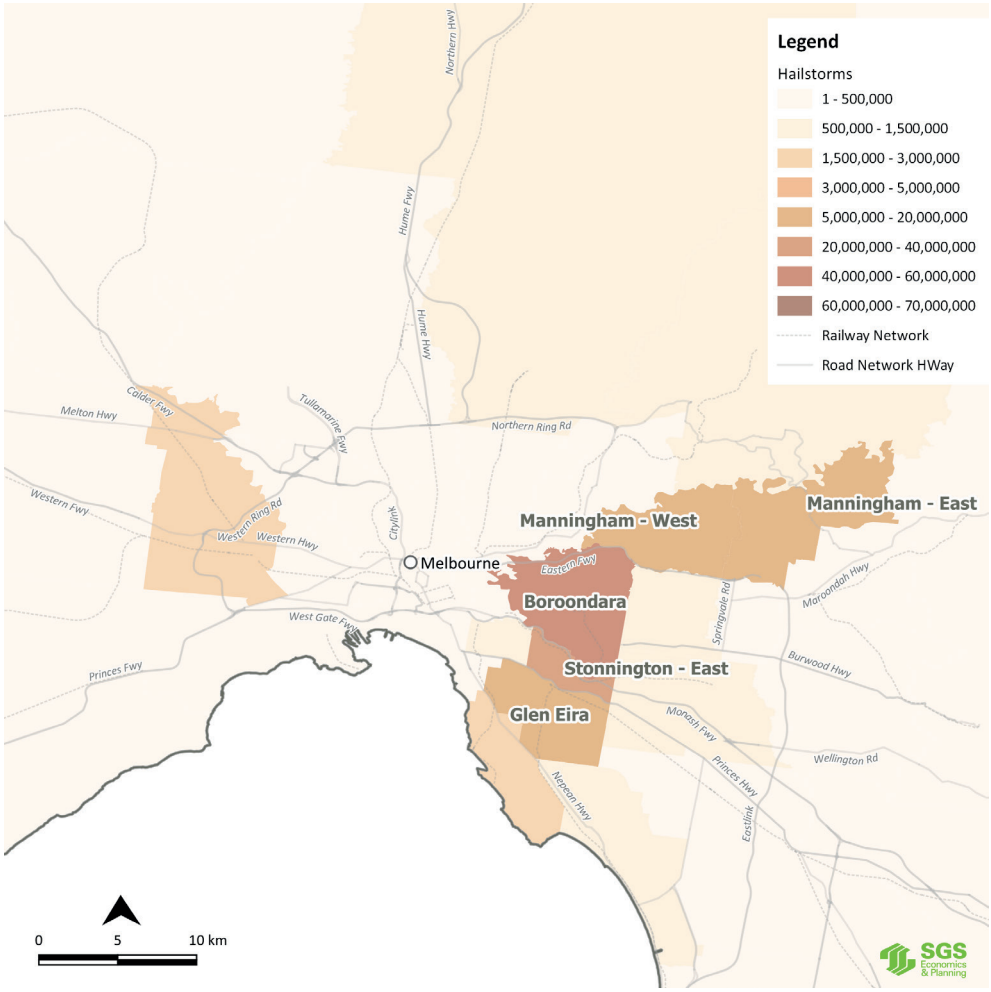
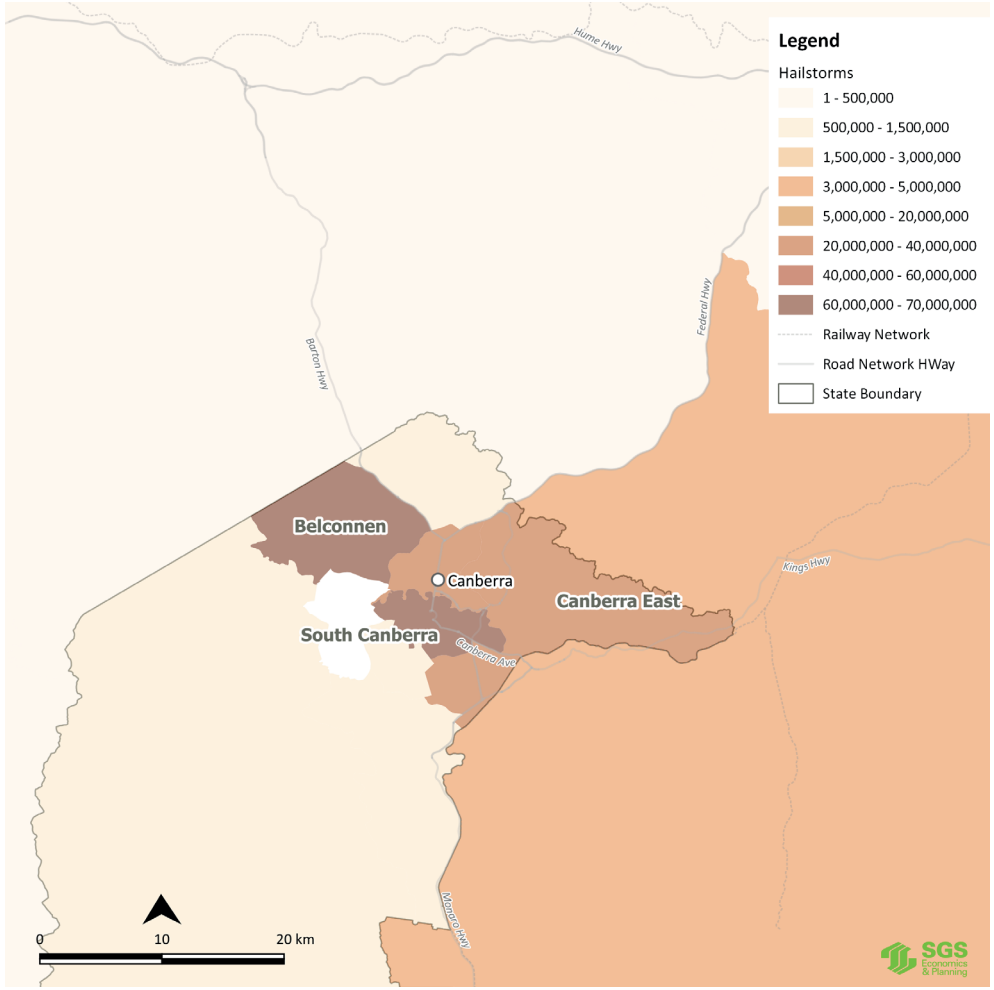
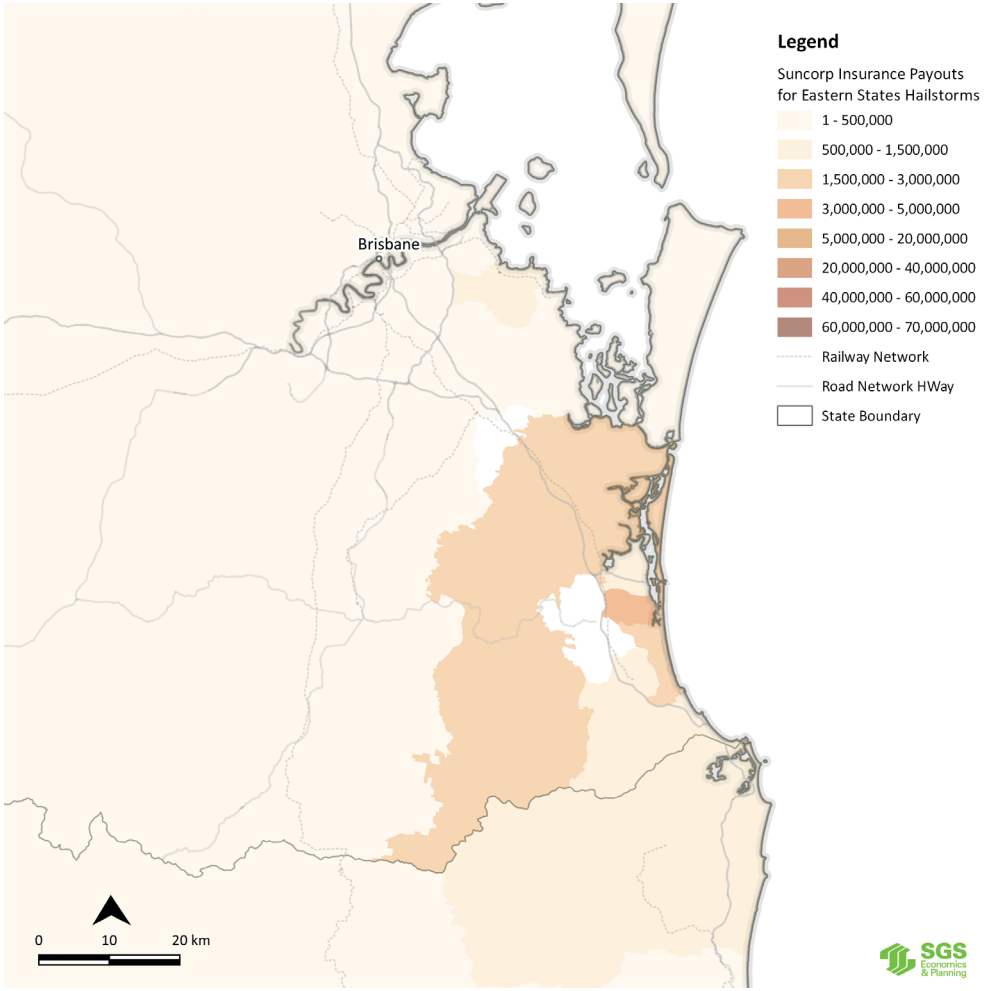


FIGURE 28: MAP OF SUNCORP CLAIMS & RECOVERY ACTIVITY – HAILSTORMS, ACT



Source: Suncorp

FIGURE 29: MAP OF SUNCORP CLAIMS & RECOVERY ACTIVITY – HAILSTORMS, QUEENSLAND



Source: Suncorp

04 Conclusion

The estimated initial economic boost from insurance claims and recovery activity resulting from the Townsville floods, Black Summer bushfires and East Coast hailstorms were $4.0 billion (0.2 per cent of GDP). The cumulative boost to GDP over three years is estimated to be $6.8 billion.

Natural disasters are a traumatic experience for those involved. Natural disasters disrupt normal economic production, destroy and damage homes, business premises and infrastructure. Some natural disasters can wreck a local economy and cause a significant and permanent reduction in the community's ability to generate income.

This report builds on previous work undertaken examining the impact of Cyclone Debbie in 2017, the Tathra bushfires and Hobart floods in May 2018. There are common findings regarding the importance of income from insurance payments helping to stabilise the economy following the initial shock from the disaster.

The COVID-19 pandemic represents the most significant challenge to the Australian economy since the Great Depression. Restrictions have shut down large parts of the economy, causing unprecedented impacts on the Australian economy. Uncertainty surrounding the COVID-19 recession means forecasting GDP growth in 2021 and beyond is very difficult, especially at the small area level. Given the aim of this report is to understand the impact of natural disasters, and not the impact of COVID-19, it has been assumed that future growth in 2021 will return to normal trend levels.

Insurance provides a way to mitigate the adverse economic impact of natural disasters. The income from insurance payments helps to stabilise the economy following the initial shock from the disaster, and the economic stimulus from claims payments promotes a more rapid return to normal economic activity.

Without insurance, it is possible that a regional economy may never fully recover from a natural disaster, as damage leads in some cases to a permanently impaired productive capacity in the long term. This is particularly the case in regional areas which have a narrow economic base.

Events of this kind are becoming increasingly common and present a real challenge for communities across the country. The collective economic loss from these disasters is estimated to be $8.8 billion without insurance. Given these types of disasters are becoming more prevalent and increasing in severity, it is expected this risk and size of economic losses will continue to grow in the future.

With large parts of Australia at growing risk from tropical cyclones, bushfires, storms and floods, the importance of insurance is only increasing. The role of insurance is especially vital in regional Australia, where there is a combination of increased risk of natural disasters and communities with a narrower economic base.

Suncorp's claims and recovery activity helps to mitigate the adverse impacts of natural disasters as income from insurance payments help local communities recover.

Appendix A

Small Area Gross Domestic Product Methodology

This section outlines the method used to estimate Gross Domestic Product for small areas across Australia. These estimates have been used in the two scenarios outlined in Chapter 2 of this report (Economic Modelling).

SGS Economics and Planning has developed estimates of economic activity for each major capital city, along with the regional balance of each state. These statistics provide improved insights into the relative economic performance of each of Australia's major capital cities (Sydney, Melbourne, Brisbane, Adelaide and Perth), the Northern Territory, Tasmania and the Australian Capital Territory. The statistics can be found here: https://www.sgsep.com.au/publications/insights/gdp-report-economic-performance-of-australias-cities-and-regions

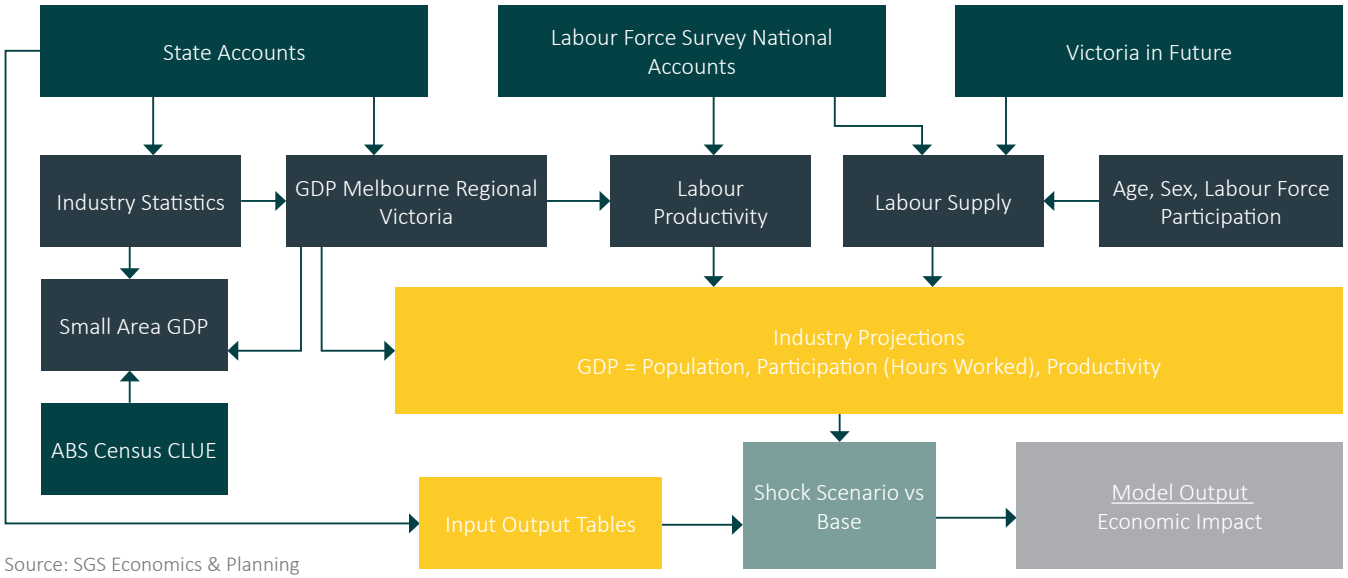
This major capital city, along with the regional balance of each state is the broken down into Statistical Area 2. To produce estimate of Gross Domestic Product at the Statistical Area 2 level, estimates are made for each industry. Industries are divided into five categories:

- Primary production – Agriculture, forestry & fishing and Mining. Information on the location of farms and mines is used to distribute regional totals. Head office operations in these industries are accounted for using an average hourly wage rate method;
- Capital Intensive – Manufacturing, Electricity, gas, water & waste services, Wholesale trade and Transport, Postal & Warehousing. Detailed 2-Digit industry gross value added per worker is combined with the number of workers is used to distribute regional totals;
- Labour Intensives – All other industries. An average hourly wage rate multiplied by total hours worked in each city is used to is used to distribute regional totals;
- Ownership of dwellings. Number of houses in the city and average rents are used to distribute State level totals to each city; and
- Taxes less subsides. The State level total is distributed in line with the total industry gross value added for the SA2.

This is done using a range of data sources including:

- ABS Agricultural Commodities, Australia, 2018-19 (Cat. No. 7121.0);
- 2016 Census of Population and Housing, Place of Work data;
- ABS Labour Force, Australia, Detailed, Quarterly (Cat. No. 6291.0.55.003);
- ABS Australian Industry, 2018-19 (Cat. No. 8155.0); and
- ABS Australian System of National Accounts (Cat. No. 5204.0).

FIGURE 30: OVERVIEW OF MODELLING FRAMEWORK



Source: SGS Economics & Planning

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