



South East NSW **RESILIENCE** **BLUEPRINT**

Adapting to a changing world



CANBERRA REGION
JOINT ORGANISATION



Australian Government



This project is jointly funded by the Commonwealth
and the New South Wales Government.



ACKNOWLEDGEMENT OF COUNTRY

Yumma (hello in Ngunnawal language)

Yiradhu marang! (good day! in Wiradjuri language)

We acknowledge Country and pay respect to the Traditional Owners and Custodians of the land and waters across South East New South Wales. We recognise and honour their ancient cultures and their spiritual, cultural and physical connections with land, waters and community.

For over 70,000 year this Country has been inhabited and cared for by First Nations people from various mobs and dialects. We pay our respects and gratitude for their stewardship and for sustaining this land where we live, work, and visit. Their connection and understanding of the natural and cultural landscape is seen and heard through art, song, dance, and storytelling practices. We recognise the importance of these First stories, the contemporary stories of displacement, and the continued journey of self-determination in Australia.

Through this Resilience Blueprint we are committed to working together to deliver better outcomes for communities and the region – where Indigenous voices are represented and respected in our practices, forums, and plans. Thank you to all First Nations people who shared their stories, insights, and teachings in contribution to this Resilience Blueprint.

“

The real benefit of the Blueprint project would be if it is effective in advocating for Aboriginal voices to be represented in LGA resilience planning and actions.
First Nations representative, Eurobodalla

”

BLUEPRINT PARTNERS

The South East NSW Resilience Blueprint was written from the input from over 2000 community members, council staff and agency representatives in collaboration with Meridian Urban, Risk Frontiers and the Canberra Region Joint Organisation.



Resilience Blueprint made by the following partners:

- Bega Valley Shire Council
- Eurobodalla Shire Council
- Goulburn Mulwaree Council
- Hilltops Council
- Queanbeyan-Palerang Regional Council
- Snowy Monaro Regional Council
- Snowy Valleys Council
- Upper Lachlan Shire Council
- Wagga Wagga City Council
- Wingecarribee Shire Council
- Yass Valley Council
- Canberra Region Joint Organisation
- Resilience NSW
- NSW Treasury
- Risk Frontiers
- Meridian Urban
- ResilientCo Consulting
- Yerra
- Happydance Creative
- Office of Energy and Climate Change - NSW Treasury
- ACT Government
- Department of Regional NSW
- NSW Department of Planning and Environment
- Infrastructure NSW
- Local Land Services South East
- Southern NSW Local Health District
- Fire and Rescue NSW
- NSW Police
- Department of Customer Service NSW
- NSW Rural Fire Service
- NSW State Emergency Services (SES)
- Red Cross
- Landcare
- University of Canberra
- CSIRO
- National Emergency Management Agency

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Illustrations by Arran McKenna (Happydance Creative). The words in the illustrations are quotes from council staff and community members from across the region.



Australian Government



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FOREWORD

In a changing world, it is hard to know which way to turn. The South East New South Wales Resilience Blueprint guides us through our changing risk landscape.

It provides tools and links to support services and resources to assist us in going forward with confidence.

The term ‘resilience’ means many different things to different people and organisations. In some ways it is positive and hopeful and in other ways, it masks deep scars and feelings of ‘toughing things out’ with little support. In South East NSW, we know exactly what resilience is. We have lived it and continue to live it each day in different ways.

We know that resilience is not so much about the strength to endure or even ‘bouncing back’, though that is the ultimate test. Rather, it is about our collective belief in a better future where we can thrive, with an awareness of our risks, having plans and measures in place, and providing proactive contributions to our ongoing resilience in good times just as much as when we face challenges. We support identifying and leveraging opportunities as they arise, to work towards our resilient future.

The South East NSW Resilience Blueprint is our plan to identify and embed resilience in all that we do.



Mayor Russell Fitzpatrick
Chair
Canberra Region Joint Organisation



EXECUTIVE SUMMARY

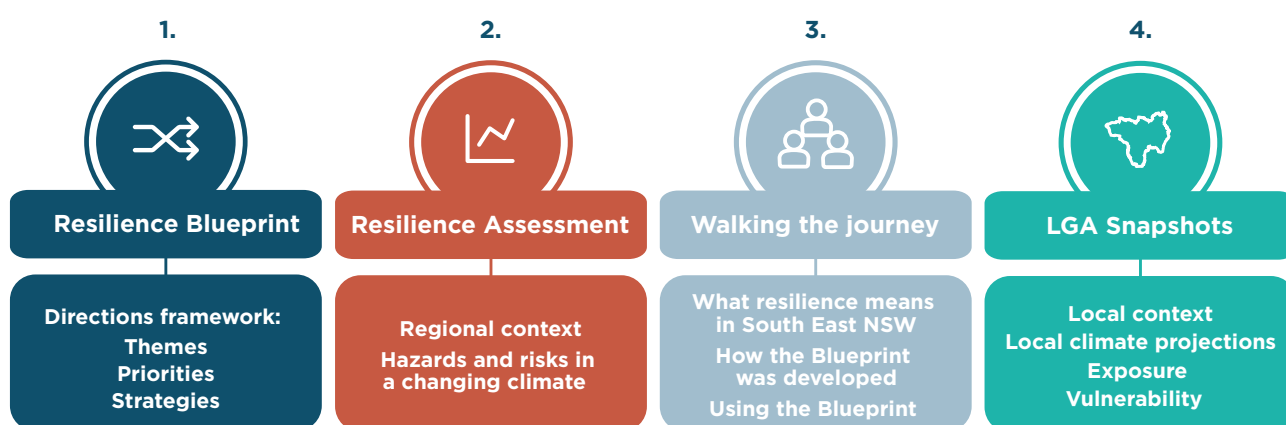
The South East New South Wales Resilience Blueprint provides a roadmap that allows each of us, in our different roles, to navigate our own resilience journey. It recognises the diversity of lived experience, the knowledge and insights of those who call this region home.

The contribution of over 2,000 participants informs this comprehensive and coordinated framework that will guide our resilience efforts moving forward. The Canberra Regional Joint Organisation (CRJO) in partnership with local, state and Commonwealth governments and affiliates has worked across the region and its communities to understand the ways in which we will prepare for and adapt to a changing future.

The Resilience Blueprint helps us consider multiple pathways to embrace and build on our existing levels of resilience, and how we can continue to grow and extend our efforts over time through a range of processes.

The Resilience Blueprint and its priorities are opportunities that can be explored and taken forward by those with a role in contributing to resilience to embed its consideration as part of day-to-day processes, across everything we do. Different stakeholders can use the resilience directions that follow to filter those that are relevant to different roles, responsibilities, circumstances and needs.

The South East NSW Resilience Blueprint comprises the following elements:



The implementation of the Resilience Blueprint is supported by:

- tools for support to translate guidance into resilience action
- defined indicator metrics to monitor and evaluate performance
- an implementation framework to embed resilience processes into business as usual.



CONTENTS



THE RESILIENCE BLUEPRINT	13
Adapting to a changing world	14
Who has a role in resilience?	16
Roles and responsibilities in resilience	
Purpose	22
Blueprint objectives	
Resilience policy context	26
Directions framework and resilience priorities	27
People, community and culture	
People, community and culture resilience directions	
The natural environment	
Natural environment resilience directions	
Built environments and infrastructure	
Built environment and infrastructure resilience directions	
The economy	
Economic resilience directions	
Leadership and strategy	
Leadership and strategy resilience directions	
THE SOUTH EAST NSW RESILIENCE ASSESSMENT	69
Our landscapes, people and places	70
Our landscapes	
Our people	
Our values	
Our places	
Understanding risk	79
Shocks and stresses	
Risk exposure, vulnerability and tolerability	
Our risks in South East NSW	82
Hazards	
Probability	
Exposure and vulnerability	
Risks in a changing climate	88
Regional hazard and risk profile	
Indicators of preparedness	
WALKING THE BLUEPRINT JOURNEY	127
Our journey of ‘resilience’	128
Our statement of ‘resilience’	131
How the Blueprint was developed	134
Using the Blueprint	137
Maturing our resilience journey	141
Implementation framework	
Additional tools	146
LOCAL GOVERNMENT RESILIENCE SNAPSHOTS	151



SECTION 1



THE RESILIENCE BLUEPRINT

ADAPTING TO A CHANGING WORLD

What we have experienced has been life changing. From persistent drought, record breaking heatwaves, Black Summer Fires, hailstorms, COVID 19 and devastating floods, we are living in dynamic times. The future is uncertain yet one thing that is certain is our ability to change it for the better.

The stakes will continue to rise without collective, proactive effort to embed resilience in everything we do. In addition to risk to people and homes, in economic terms the projected costs of disasters over the next forty years is unsustainable. We need to break the cycle of reactive response and recovery, and inject more focus and investment into those things that will stand us in better stead the next time we are tested.

But what are those things?

The South East New South Wales (NSW) Resilience Blueprint helps us to identify and navigate how we can embed resilience thinking into our processes and decisions, giving us more control over our future.

We all have a role to play, as individuals and households, governments, non-government organisations, businesses – we all have our own processes and decisions we need to make.

The South East NSW Resilience Blueprint provides the architecture to create change for a more resilient and climate-ready future. It is both the map for how we get there, and the process of the people of our region coming together for the journey.

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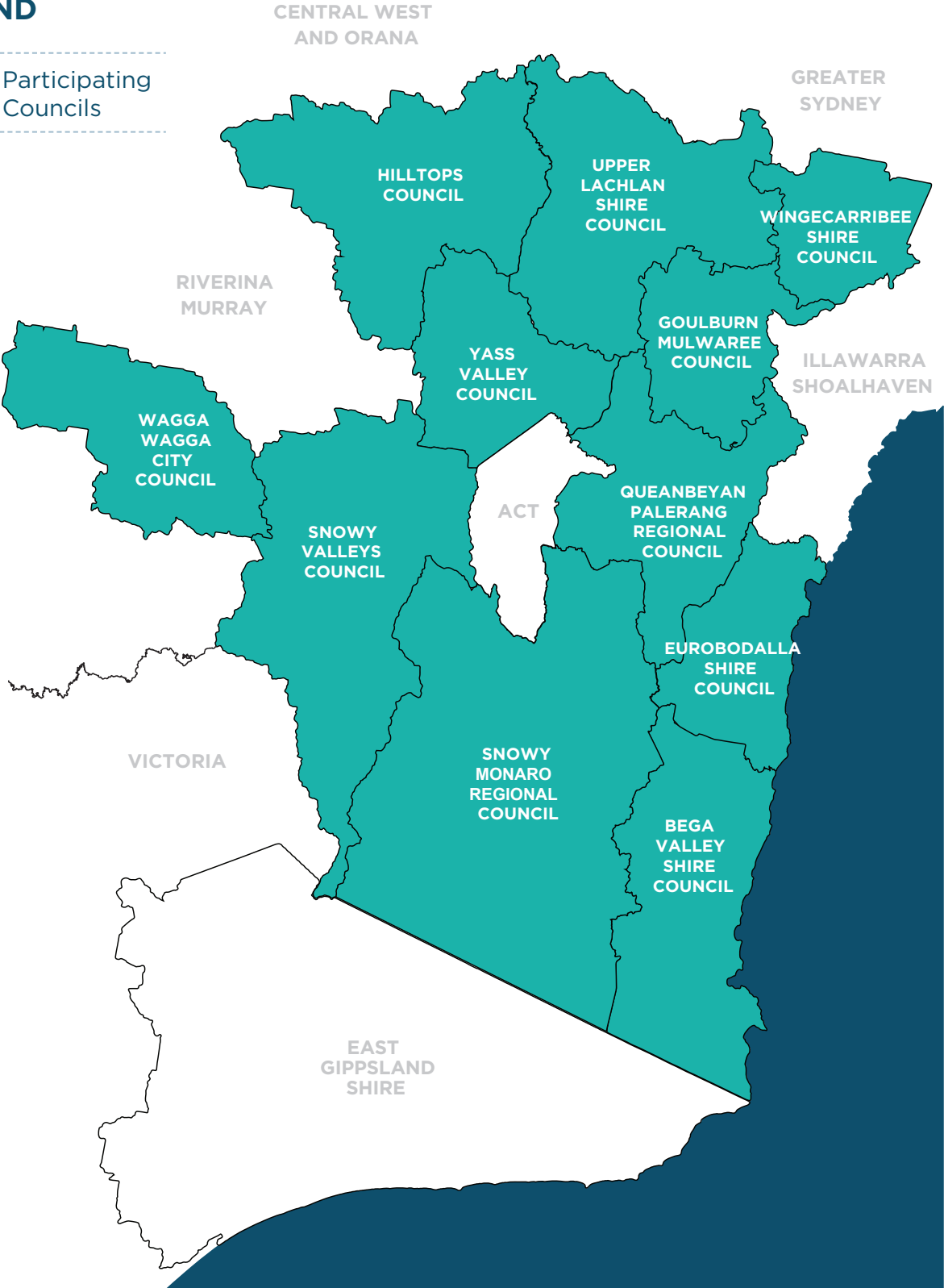
It all changed with urgent knocking on doors – ‘are you ready?’ we asked our neighbours. We were facing fires like we had never experienced before. Only some of us were ready to act, knew the risks, what we needed to do and what help was available. Too many of us were unprepared. Many of those with plans based on past experiences found their plans outdated as these fires were acting in ways we never saw before. The fires brought so much loss to our community. We need better ways of doing things so we are all ready next time there is a knock at the door.
- Bega Valley resident

”

**ARE
YOU READY
FOR THIS?**

LEGEND

Participating Councils



WHO HAS A ROLE IN RESILIENCE?

UNITED NATIONS OFFICE FOR
DISASTER RISK REDUCTION

“

Resilience is the ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management” (UNDRR, 2022).

”

Resilience is influenced by many aspects of government policy and legislation that address matters such as emergency management, infrastructure provision, health and safety, and environmental protection.

Statutory functions of government form only one part of what it takes to be resilient. This is because a person, community or place is not resilient just because there are jurisdictional roles and responsibilities in place.

Government cannot ‘make’ people or place become resilient, nor is there a statutory function of government for every aspect of resilience. This is because resilience, disaster risk reduction, adaptation and preparedness are not the single responsibility of any one entity or group. They are shared responsibilities across government, individuals, communities, businesses and organisations. Sharing responsibility can mean that each entity or sector is responsible for certain outcomes or performing certain roles.

But government can enable and partner with others to:

- Support people and communities, organisations and businesses to understand their risks and responsibilities, and develop resilient behaviours and practices to anticipate, withstand, and thrive despite stresses and shocks
- Provide confidence to the community it is making risk-informed decisions across its responsibilities, to limit risk increases and actively mitigate existing and emerging stresses and shocks.

Building resilience in people, community and place therefore relies on partnerships, where all sectors actively identify opportunities to 'lean into' the spaces between statutory roles – the space of 'moral obligation'.

Actively identifying these spaces where multiple entities can contribute to the outcome is a collective ownership, a moral obligation to help each other and shoulder more if the circumstance requires it. Sharing responsibility, but also collectively owning the gaps between those responsibilities creates the 'mesh' that builds cohesive and resilient communities and places.

The Resilient Blueprint encourages and prioritises collective impact over self-interest. It is only through collectively addressing our challenges will we advance on our journey towards resilience.

**THIS PROCESS
IS BRINGING ME
HOPE**

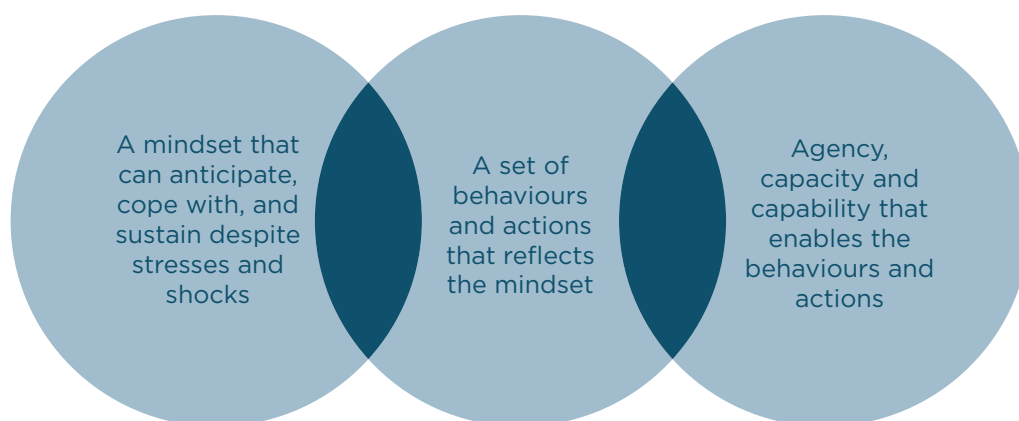
ROLES AND RESPONSIBILITIES IN RESILIENCE

Adapting to a changing world and progressing along our resilience journey requires different things from different groups and often, as individuals, we may form part of more than one group. This adds to the tapestry of how we each understand and interpret what it takes to be resilient, where we can view the same issue through multiple viewpoints.

Whilst everyone has a role, the scale of the role varies, and involves different things from different groups.

People and communities

The journey of resilience starts with the individual. A community or place cannot be resilient without resilient people. In being resilient, an individual's role is to strive to embody:



Individuals and households anticipate and respond to various stresses and shocks each day, whether it be a stressful work environment, a suddenly sick family member, or significant financial challenges. The skills you need to thrive despite those circumstances are the same skills you need to thrive despite natural hazard stresses and shocks.

People come together as 'communities of place' or 'communities of interest'. Communities of place are formed by virtue of being part of the same suburb, district or town. Connections develop in these communities through family relationships, generational ownership of land, and a desire to live and prosper in a specific area with specific circumstances, values or landscape characteristics.

Communities of interest come together because of common interests or needs, like sporting groups, progress associations or societies. Bonds between people can be strong in these types of communities, as people generally choose to come together based on those commonalities.

Either way, the role of a community is to support each other, while each community member has a responsibility to each other. A resilient community ‘fills gaps’ that emerge during times of stresses and shocks, whether it be sharing accurate hazard information, to helping each other (particularly vulnerable persons) to prepare or evacuate, or to supporting short and long term recovery activities. As government can only do such much, a community that actively identifies and fills any gaps that emerge will ultimately emerge stronger and more cohesive, and therefore more resilience.

Organisations, services and businesses

Organisations, services and businesses have an often understated but critical role to play in the resilience of communities and places. They provide the economic underpinning for people’s socio-economic prosperity – a resilient place has a resilient economy.

Often the resilience of these entities can be summed up as simply business continuity planning and pre-event preparations, but a truly resilient business or organisation is much more than that.

A resilient business understands that stresses and shocks can represent critical risk factors to the viability of the business. It identifies these stresses and shocks at the enterprise level, not just the continuity level, and anticipates these so the business does no suffer substantial loss or bankruptcy when they occur.

Local government

As the level of government closest to community, local government wears many hats. It has a wide range of statutory service delivery obligations, it acts as a voice for the community to higher levels of government, makes urban growth and land use planning decisions, maintains and enhances physical and community infrastructure, is responsible for the local dimensions of emergency management, and otherwise provides a wide range of services to support its community.

It can also provide many other community-servicing functions that ‘fall through the cracks’ of state and federal agency service delivery models to ensure its community is properly supported, even though there may be no statutory requirement to do so.

This is particularly the case with resilience.

Local government is also the level of government with the least resources to perform the functions it is required or requested to provide. Councils have statutory responsibilities for prudent financial management and are subject to stringent reporting under the Integrated Planning and Reporting (IP&R) Framework. Councils must be careful how and where it allocates its limited resources.

In addition to its statutory and non-statutory responsibilities, Councils also have a role in identifying and advocating for projects and activities that are needed in local areas to build resilience and mitigate existing and emergent risks. They also must actively utilise existing governance arrangements, such as the emergency management arrangements, to identify risks and issues that it cannot manage on its own, and transfer these risk / issues to higher levels of government to address.

State government

The State government has a strong supporting role to play in advancing resilience locally, both in strengthening communities and places prior to events and providing resources and support during and following such events.

This is achieved in three ways:

1. Actively undertaking its identified and assigned emergency management responsibilities as per local and district level emergency management plans and the State Emergency Management Plan (EMPLAN).
2. Maximising delivery of practical support through provision of funding,, resourcing and technical assistance to local government and community-level organisations to perform the functions these entities are statutorily required or morally obligated to perform.

Ensuring government activities and services, such as provision of transport, health, urban development, administration, and the like do not inadvertently increase risk or increase vulnerability into local systems.

Commonwealth government

The Commonwealth government is responsible for national leadership on adaptation, managing Australian Government assets and services including significant investments in public infrastructure, and providing national climate science and information. It maintains a strong, flexible economy and well-targeted safety net to ensure that climate change does not disproportionately affect vulnerable groups.

‘CONTROL’ VERSUS ‘INFLUENCE’

In our varied roles that contribute towards enhancing resilience, some things may be in our direct ‘control’, and others we might not control but we can ‘influence’.

For example, as an individual or as a household we can control whether we prepare our properties and have disaster plans and evacuation plans in place. We cannot control whether our neighbours have a plan, but we can help to influence them but discussing our plan with them and asking what their plan involves.

We can also actively ‘advocate’, which is a public expression of support for an idea, need or position.

The control versus influence contrast exists across all aspects of resilience and we must remember that whilst we might not have direct control of something, does not mean we are not part of the solution.

CONTROL & INFLUENCE



PURPOSE

Communities and councils impacted by fires and other disasters across South East NSW acknowledge the need to do things differently in response to rapidly evolving land uses and climate change. We need new ways of working together in partnership to undertake the necessary actions required to prepare for and prevent the impacts of disasters and to recover and rebuild in more resilient ways.

The South East NSW Resilience Blueprint facilitates councils and communities across South East NSW to better prevent, prepare, respond and recover from future disasters and challenges. The vision is for individuals, families, communities and organisations to confidently navigate a changing world.

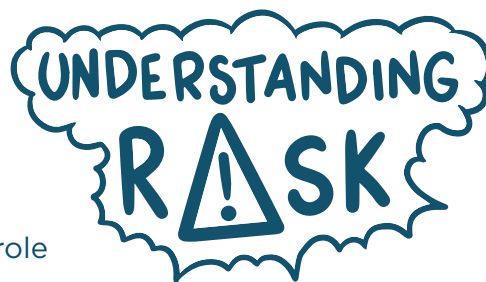
The Blueprint is a partnership between councils, community, business, organisations, emergency services and state and federal government agencies to embed resilience in decision making. The range and scale of disasters, stress factors and changes to our climate mean we need new partnerships between government and community, with clear roles and responsibilities for prevention and preparedness.

BLUEPRINT OBJECTIVES

The objectives of the Resilience Blueprint are to ensure that resilience principles are incorporated and continuously improved upon as part of everything we do. This is achieved through:

For people and communities:

1. a greater understanding of risk
2. recognising lessons learned as opportunities to grow resilience
3. empowering people and communities to have a role
4. harnessing local solutions to local issues.



For governance processes:

1. establishing evidence in the context of community values and commitments, and available funds and resources
2. ensuring decision-making processes and priorities are informed by risk-based evidence
3. adopting coordinated and collaborative approaches
4. adaptive governance that flexes with changed circumstances
5. identifying prioritised activities to direct funding to need.



A snapshot overview

The Blueprint maps the forward resilience journey for South East NSW. It comprises:

- five ‘system environments’ which include people, community and culture, the natural environment, building environment and infrastructure, the economy and leadership and strategy
- each system environment is underpinned by a series of resilience themes prioritised by people from across South East NSW
- each of the 15 themes are supplemented by a framework of resilience directions that comprise:
 - 30 priorities
 - 168 strategies
 - indicator metrics.
- supporting the system environments, themes and directions are the breadth of stakeholder groups, each with a different role in enhancing resilience
- across all system environments are processes of embedding, monitoring and evaluation and integration of resilience concepts across the PPRR spectrum of activities led by different stakeholder organisations.



SOUTH EAST NSW RESILIENCE BLUEPRINT

SYSTEM ENVIRONMENTS

PEOPLE | NATURE | ECONOMY | BUILT FORM | LEADERSHIP

RESILIENCE DIRECTIONS FRAMEWORK

RESILIENCE THEMES

RESILIENCE PRIORITIES FOR SE NSW
STRATEGIES FOR ENHANCED RESILIENCE

INDICATOR METRICS

IMPLEMENTATION FRAMEWORK

TOOLS FOR SUPPORT

IMPLEMENTATION PATHWAYS

PPRR APPROACHES
EMBEDDING PROCESSES
MONITORING AND EVALUATION

Figure 1 - The South East NSW Resilience Blueprint

The five resilience system environments reflect different realms of resilience. This approach allows us to contemplate the resilience priorities relating to different system environments, which can help to 'break down' the exact contributions to resilience-building efforts that are required, and who might best lead them.

The interconnections between system environment are significant, they cannot be siloed or considered in isolation of other system environments.

These system environments link local and regional resilience priorities with state, national and international directions for resilience, disaster risk reduction and sustainable development. This includes pillars identified by the NSW Climate Change Adaptation Strategy and the National Framework for Disaster Risk Reduction.

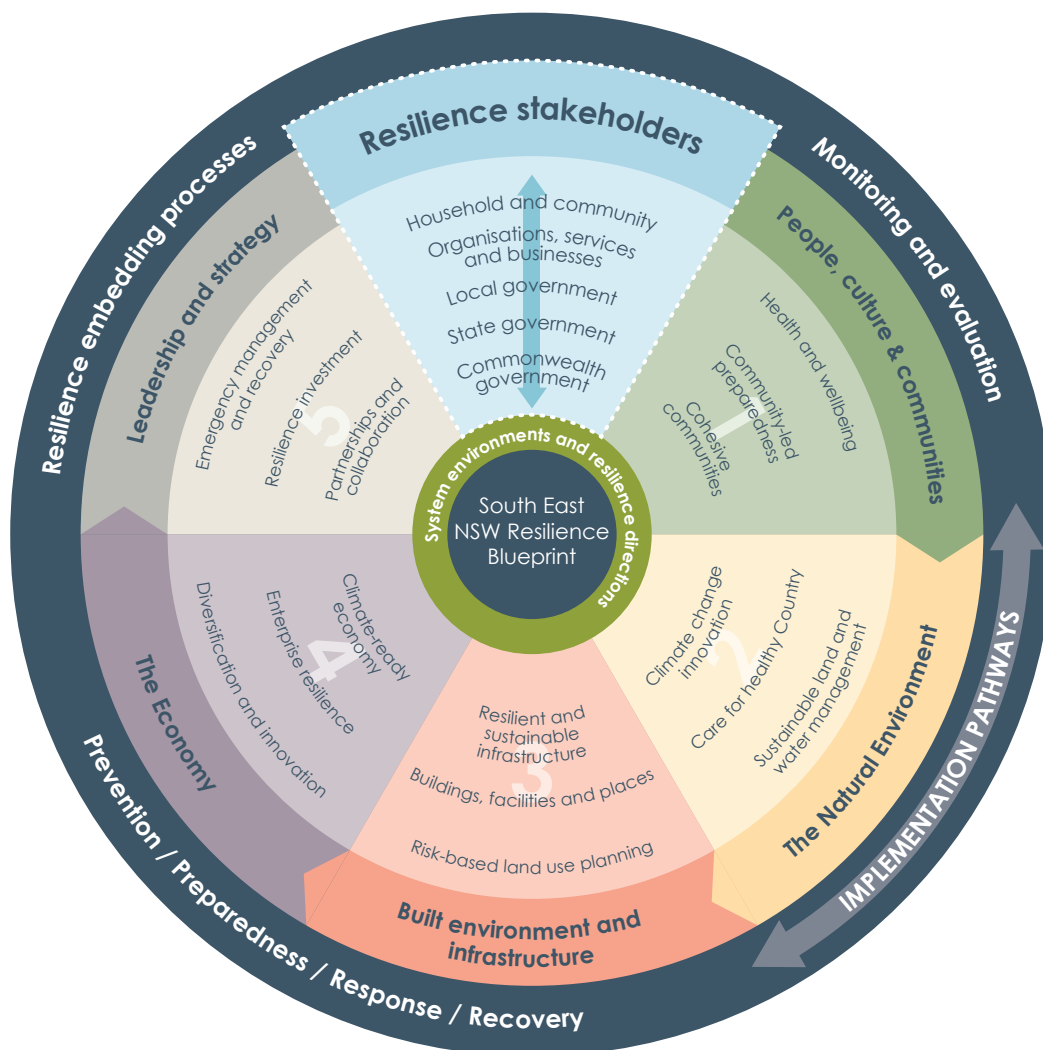


Figure 2 - The South East NSW Resilience Blueprint approach

RESILIENCE POLICY CONTEXT

The Resilience Blueprint integrates and aligns with a series of local, state-wide, national and international frameworks, plans and strategies that focus on emergency management, disaster risk reduction, sustainable development and climate adaptation.

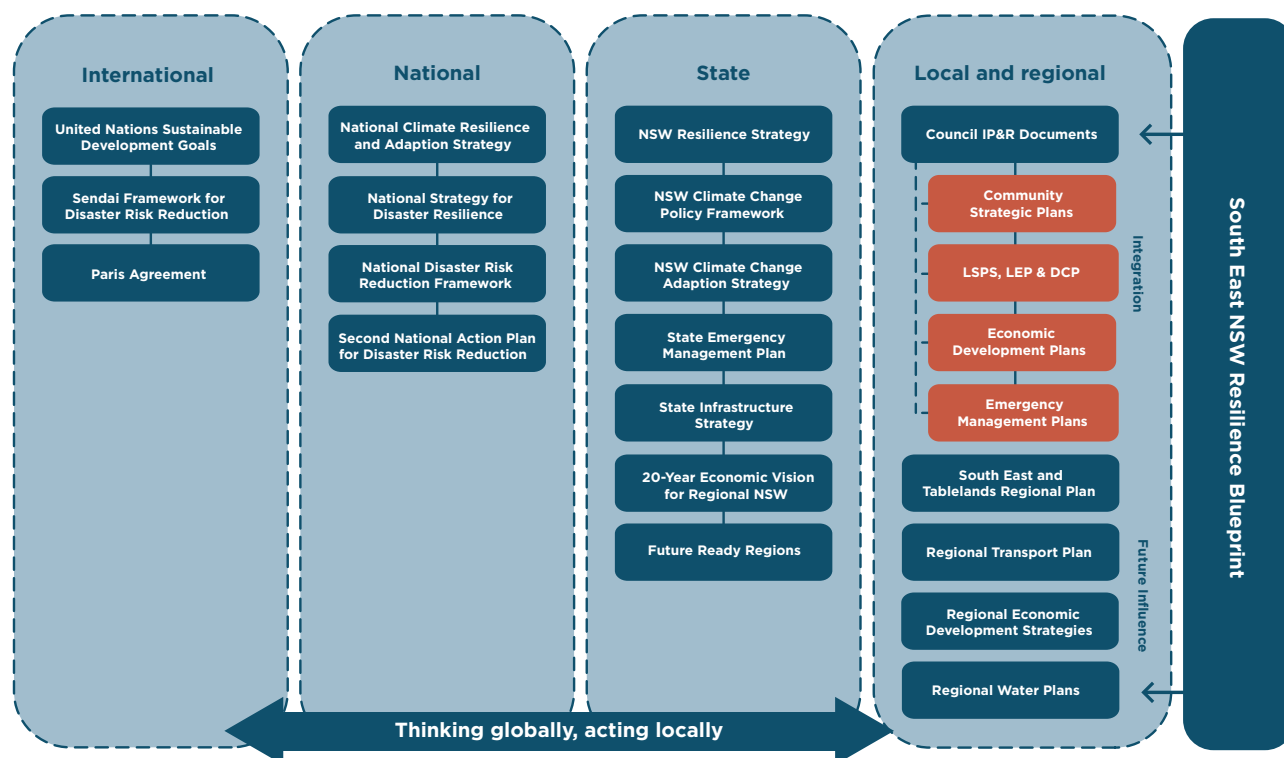


Figure 3 - The relationship of the South East NSW Resilience Blueprint to the broader policy and strategic landscape

The Resilience Blueprint will integrate into local government Integrated Planning and Reporting (IP&R) Framework documents, embedded as a core element of local government operational activities.

It provides opportunities to influence the future iteration of regional-level strategic plans, as a key locally-led by regional-scale input which contributes to enhanced resilience outcomes for South East NSW.

This adds additional dimensions to the spectrum of resilience embedding opportunities.

A further element of the policy and strategic context to which the Resilience Blueprint relates are the findings and recommendations of the many Commissions, Inquiries and Reviews conducted into disaster events and arrangements at the state and national level, including the 2022 NSW Flood Inquiry, the Select Committee on the Response to Major Flooding across NSW in 2022 report, and the 2020 Royal Commission into National Natural Disaster Arrangements and the 2020 NSW Bushfire Inquiry which followed the devastating Black Summer bushfires with significant policy, practice and operational observations relevant from a resilience perspective.

DIRECTIONS FRAMEWORK AND RESILIENCE PRIORITIES

One of the key elements of the Sendai Framework for Disaster Risk Reduction is about better understanding the risks we face. By contemplating our risks, we are better equipped to develop plans for how we can address key risk and resilience issues to avoid or mitigate certain impacts, thereby lessening our exposure or vulnerability to them, over time.

The Resilience Blueprint includes five resilience ‘system environments’ which reflect different realms of resilience. This approach allows us to contemplate the resilience priorities relating to different system environments, which can help to ‘break down’ the exact contributions to resilience-building efforts that are required, and who might best lead them. The interconnections between each are significant, they cannot be siloed or considered in isolation of other system environments.

These system environments link local and regional resilience priorities with state, national and international directions for resilience, disaster risk reduction and sustainable development.

These priorities and their associated strategies have been directly informed by governments, community groups, businesses, knowledge specialists, researchers and over 2,000 Resilience Blueprint participants from across South East NSW,

The Resilience Blueprint and its priorities are opportunities that can be explored and taken forward by those with a role in contributing to resilience to embed its consideration as part of day-to-day processes, across everything we do. Different stakeholders can use the resilience directions that follow to filter those that are relevant to our own circumstance and needs.

The following systems environments and resilience priorities map the forward resilience journey for South East NSW.

INTERPRETING OUR RESILIENCE DIRECTIONS: A QUICK GUIDE

The system environments that support the Resilience Blueprint are underpinned by a series of directions which help us to navigate our particular resilience need, depending on our role – as an individual, community group, service agency or organisation, a private sector business or government.

To navigate the resilience directions for each system environment:

THEMES – our resilience themes are overarching interests derive directly from stakeholder participation to inform the Resilience Blueprint. Over 2,000 stakeholders were involved.

EXAMPLE APPROACHES – resilience has long been in action across the region. Here we highlight some examples of activities which demonstrate the intent of the resilience themes.

TOOLS FOR SUPPORT – whether we want to boost our resilience as a household or contribute to resilience outcomes as a service organisation, there is a broad suite of tools available to help us on our own resilience journey, and build our awareness.

PRIORITIES – our priorities outline the resilience aspirations we seek to achieve. These may change over time as a result of continuous improvement. This means that we can continue to consider new opportunities and fill emergency gaps as they arise.

STRATEGIES – our resilience strategies detail the approaches we can consider in order to address our priorities. It is important to remember that many strategies will involve multiple partners and enablers, everyone has a role.

INDICATOR METRICS – these feature both quantitative and qualitative metrics that help us measure and interpret elements of resilience maturation over time. Not all aspects of resilience can be measured in number terms and so it is important for us to look deeper.

PEOPLE, COMMUNITY AND CULTURE

The people, communities and cultures of the South East are at the heart of why bolstering our existing levels of resilience is so important.

Theme 1: Health and wellbeing

Maintaining and enhancing physical and mental health and wellbeing are a cornerstone of the Resilience Blueprint. More than any other aspect, good health and wellbeing is the number one aspiration of communities across South East NSW.

There has been a lot to deal with. There is a journey to go, and that is okay.

Support to help individuals and communities to deal with extremes and stress requires a long-term and enduring approach, it is not just an issue in times of recovery. It must be a continuous focus, and resourced and funded appropriately. Our people are our greatest asset and they require investment.

Theme 2: Community-led preparedness

Communities are empowered and have agency in relation to those elements which are within their realm of control and influence. Some things we cannot control or influence, and some we can. Where we can, we act.

People and communities self-educate, and are provided with the information and intelligence to do so, to develop plans and inform decision making. This is done proactively, because waiting until an event is imminent is too late. This approach means that as a community, we are never complacent.

People and communities can learn and seek mentorship on First Nations' traditional and modern practices and teachings on caring for Country.

Theme 3: Cohesive communities

Social connections vastly increase our levels of resilience. This goes beyond our own participation as a citizen in our community, but is also about ensuring our communities are inclusive and diverse. It also includes having an awareness of the needs of those who may be more vulnerable, this may be due to illness, age or physical or social isolation.

This does not necessarily mean that we do things for others, but rather that we help them to realise their own abilities and realms of control and influence.

These characteristics and approaches strengthen our social fabric, and they are celebrated.

Experience and knowledge is shared for the benefit of the wide community, and across generations.

Growing resilience requires us all to stretch boundaries.

Experience and knowledge is shared for the benefit of the wide community, and across generations. Growing resilience requires us all to stretch boundaries.

RELATIONSHIPS

“

I would feel better prepared if I were better linked to my neighbours, local response and recovery organisations through regular get-togethers and practical get ready sessions.” - Queanbeyan-Palerang resident

”



EXAMPLE APPROACHES FROM ACROSS THE REGION

'Fire to Flourish' is a five-year transdisciplinary program led by Monash University working at the intersection of disaster resilience and community development. Fire to Flourish aims to support communities to lead their own recovery, co-create foundations for long-term resilience and wellbeing, and disrupt cycles of entrenched disadvantage. By harnessing the power of local leadership and action, the program will trial and scale a new model of community-led resilience, amplified through partnerships with government, philanthropic, not-for-profit and private sector organisations.

Community-led street and neighbourhood 'WhatsApp' groups established in Bega Valley to share preparedness information and local needs, build connections and relations, and a platform to seek and offer help to neighbours.

'Child friendly spaces' set up by Save the Children in Wagga Wagga and Bega to provide children with a safe and inclusive place to play, laugh and socialise whilst parents could have some respite and deal with things like insurance, securing accommodation and seeking government services.

'Currowan: A story of a fire and a community during Australia's worst summer' was written by Eurobodalla Shire resident and journalist, Bronwyn Adcock. A local's account of the Black Summer bushfires and the Currowan fire from the perspective of what was experienced, seen, thought and felt.

The 'Regenerate Eurobodalla' program seeks to build community resilience through leadership, growing capabilities to operate in complexity and contribute to effective action in service of a shared purpose.

Wiradjuri culturally-inclusive curriculum at Tumut Pre-School through the Australian Government's Indigenous Advancement Strategy, employing Indigenous educators to building relationships and link with Elders and share knowledge.

The Firesticks Alliance Indigenous Corporation is an Indigenous-led network and aims to re-invigorate the use of cultural burning by facilitating cultural learning pathways to fire and land management. It provides Indigenous leadership, advocacy and action to protect, conserve and enhance cultural and natural values of people and Country through cultural fire and land management practices. It is an initiative for Indigenous and non-Indigenous people to look after Country, share experiences and collectively explore ways to achieve their goals.

TOOLS FOR SUPPORT

For people and communities:

- Council website emergency management pages and social media
- [NSW Fires Near Me](#) (also available as an app)
- [NSW RFS plan and prepare tools](#)
- [NSW SES emergency kit information](#)
- [NSW SES Your Risk suburb look-up](#)
- [Preparing for emergencies](#) provided by the Australian Red Cross
- [Natural Hazards Research Australia's 'Care4Guide'](#) resources for young volunteer positive mental health and wellbeing

For governments and service organisations:

- [Australian Red Cross 'Understanding Preparedness and Recovery'](#) report
- [Handbooks for small and large recovery organisations](#) prepared by the University of Canberra
- 'Strengthening disaster preparedness in human service organisations' project report prepared by Charles Sturt University in Wagga Wagga
- 'Person-Centred Emergency Preparedness' (P-CEP) for disability inclusive disaster risk reduction prepared by the University of Sydney
- Natural Hazards Research Australia's diversity and inclusion framework:
 - ['Learning as We Go: Developing effective inclusive management'](#)
 - ['Building inclusive partnerships with culturally and linguistically diverse \(CALD\) communities'](#)
- [University of Canberra regional wellbeing survey reports](#)
- [The Economic Cost of the Social Impact of Natural Disasters](#) prepared by the Australian Business Roundtable for Disaster Resilience and Safer Communities
- [Australian Institute for Disaster Resilience \(AIDR\) Handbook Collection:](#)
 - Community engagement for disaster resilience
 - Community recovery
 - Disaster resilience education for young people.

PEOPLE, COMMUNITY AND CULTURE RESILIENCE DIRECTIONS

THEME: HEALTH & WELL-BEING

SYSTEM PRIORITIES

We are open about mental health

We facilitate access and foster a culture of mental health awareness and support

STRATEGIES

People and communities

- Fostering behaviours that support people to reach out for support

Service agencies and organisations:

- Awareness of mental health referral and options for help are clear and shared
- Psychological first aid training to support those who support others
- Training of staff and volunteers on how to support people experiencing trauma

Government:

- Psychological first aid training to support those who support others
- De-brief to discuss and share experiences at different intervals throughout the resilience and recovery cycle
- Training of first responders, staff and elected officials on how to support people experiencing trauma

INDICATOR METRICS

- Regional wellbeing survey community wellbeing indices
- Access to health services
- Number of training modules delivered
- Drug and alcohol abuse data
- Domestic violence data
- Suicide and suicide prevention data
- Number of physical health programs delivered

NOTE: mental health referrals is not an effective indicator as referrals should be expected to increase because of supportive intervention.

THEME: COMMUNITY-LED PREPAREDNESS

SYSTEM PRIORITIES

We anticipate risks and impacts in advance, and plans are developed to avoid, mitigate and be ready

STRATEGIES

People and communities

- Individuals and communities are proactive about understanding their risks and taking steps to plan and be prepared. It is too late when an event is imminent
- Property maintenance and land management underpins our preparedness
- Peer-led approaches support neighbourhood and whole-of-community resilience
- Checking insurance policies and keeping them up to date with adequate coverage
- Specific support for newcomers and the information and knowledge they need
- Plan for pets and livestock for different weather events

Government

- Investment in community-scale capability and capacity, including community leadership programs
- Information to help people understand their risks and make informed decisions is provided
- Provision of clear frameworks for volunteer support
- Emergency services and allied agencies take an all-agencies approach to clearly communicating the various roles and responsibilities of all actors in emergency management processes

INDICATOR METRICS

- Households with an emergency plan / bushfire survival plan
- Households with an emergency / evacuation kit
- Households with plans for pets, working animals and livestock
- Insurance data
- Understanding of roles and responsibilities in emergency management and resilience
- Community participation in decision-making
- Clear communication channels and processes are in place

THEME: COHESIVE COMMUNITIES

SYSTEM PRIORITIES

We invest time and energy in community connection
 We value diversity and inclusion
 We put in place measures to protect our community values
 We support our supporters

STRATEGIES

Everyone:

- Community events foster community connection
- Hyper-local opportunities for neighbourhood connection and information sharing are embraced
- First Nations' practices and processes are valued and funded
- First Nations knowledge and culture is respected and valued
- Elevate the voices of and empower the youth. Support for youth leadership is a priority
- Multiculturalism is embraced and celebrated
- The value of volunteerism underpins strong communities. Volunteers are recognised and valued
- Support for vulnerable persons is provided
- Support, information and resources for new residents is provided
- Council-community partnerships are prioritised and reflected through local processes

INDICATOR METRICS

- Regional wellbeing survey community wellbeing indices
- Number and diversity of community events
- Attendance and patronage levels of community events
- Funding for First Nations' practices
- Youth program resourcing and delivery
- Census data community profiles
- Levels of community volunteerism and participation
- Rates of computer literacy
- Demand for community programs and services for the vulnerable
- Involvement of human service organisations in local processes
- Representation of diverse views and voices
- Availability of assistance to culturally and linguistically diverse communities

THE NATURAL ENVIRONMENT

The health of the landscapes and environments in which we live, work and visit underpin all aspects of resilience. Ensuring the health of Country is pivotal to ensuring the longevity of the unique natural wonders, threatened and endangered ecosystems of South East NSW.

Theme 1: Sustainable land and water management

How we manage land, water and waterways in a sustainable manner contributes enormously to the natural processes and functions of the landscape which supports agricultural production as well as the ecosystems and biodiversity upon which life depends.

Innovative approaches to sustainably maximise land use productivity are deployed, having regard to broader landscape needs and vulnerabilities. There is a natural connection between healthy Country and its protection in its own right, and our ability to produce food to sustain communities as part of a stable economy.

Theme 2: Care for healthy Country

The protection of natural systems ensures the intrinsic values of Country are respected and understood. All parts of the system are connected and interdependent. First Nations people must have a greater place in decisions and data collection regarding Country and contemporary environmental challenges.

Restoring the health of Country is an enduring pursuit.

Theme 3: Climate change innovation

Across the region there is a strong awareness of climate change and its impact on the environment, natural systems, functions and processes. Innovation that is focused on the enhancing the health of environmental values can be achieved through combinations of Indigenous knowledge and western science.



“

Now that our voices are starting to be heard, should we not also be given a formal role of some sort in the decision-making processes within local government, especially anything to do with place and Country?
- First Nations resident

”

CONSIDER the
INDIGENOUS KNOWLEDGE
WE CAN DRAW ON

“

“We need to re-set the vegetation benchmark for native vegetation based on traditional, Indigenous values. Connecting with Aboriginal organisations and Local Aboriginal Land Councils, relationship building to deepen knowledge of management practices. We can learn by doing, together.”- Snowy Monaro resident

”

EXAMPLE APPROACHES FROM ACROSS THE REGION

The ‘Landscape Recovery through Regional Connectivity’ project is a partnership between South East Local Land Services and nine Landcare groups to support the recovery of native species and ecological communities through investment in social capital across bushfire affected areas in the region.

Cultural burning on Yuin Country by Firesticks Alliance and Local Land Services which has deployed Indigenous fire methodologies which focus on reading the landscape and listening to Country.

The ‘Working Together to Support Sustainable / Regenerative Farmers Expo’ is a concept facilitated by the Community Voice for Hume and is an example of locally-driven approaches that explore the role and benefits of sustainable and regenerative agriculture in building soil carbon, improving soil hydration and sequestration, and food security.

The ‘Zero SE’ is a citizens alliance dedicated to reducing carbon emissions to zero in South East NSW, using evidence-based research around opportunities to reach emissions targets whilst creating local jobs and supporting a healthy environment into the future.

TOOLS FOR SUPPORT

For people and communities, businesses, service agencies and organisations:

- [7-day ensemble streamflow forecasts](#) for water management available from BoM
- [Enabling Adaptation in the South East \(EASE\)](#) report prepared by AdaptNSW
- [South East Landcare](#)
- [Drought Knowledge Centre](#) available from BoM
- [Drought Resilience Self-Assessment Tool](#) available from the Commonwealth Government
- [Climate Services for Agriculture](#) available from the Commonwealth Government

For governments:

- [National Climate Resilience and Adaptation Strategy 2021-2025](#) prepared by the Commonwealth Government
- [NSW Climate Change Adaptation Strategy](#) prepared by AdaptNSW
- [NSW Climate Data Portal](#) available from the NSW Government
- [Coastal Management Toolkit](#) available from the NSW Government
- [NSW Water Strategy and regional water strategies](#) available from the NSW Government
- [Natural resource management plans](#) prepared by Local Land Services
- [Sustainable Land Management Practices for Graziers: Best management practices for grazing in the Tablelands and southern Highlands of NSW](#) prepared by Department of Primary Industries
- [Australian Bureau of Agricultural and Resource Economics and Sciences \(ABARES\)](#) datasets
- [Transitional Native Vegetation Regulatory Map](#) available from the NSW Government
- [Biodiversity Indicator Program for NSW](#) available from the NSW Government
- [NSW BioNet](#) available from the NSW Government



NATURAL ENVIRONMENT RESILIENCE DIRECTIONS

THEME: SUSTAINABLE LAND AND WATER MANAGEMENT

SYSTEM PRIORITIES

We invest in sustainable practices
 We contribute to biodiversity health
 We contribute to effective biosecurity outcomes

STRATEGIES

Businesses, community groups, service agencies, organisations and governments:

- Communities of practice are supported through participation
- Regenerative agricultural practices are advanced
- Groundcover management processes are implemented
- Nutrient run off into waterways is mitigated
- Riparian buffers are enhanced for wildlife refuge corridors and water quality purposes
- Fish screens in agricultural landscapes are installed to protect native aquatic species and support sustainable water management
- On-farm flood and drought management plans are developed and enacted
- The region's food security is protected
- Travelling stock routes continue to provide important biodiversity refuge and support stock movement, including during emergencies
- Weed, pest and disease outbreak is avoided, mitigated or managed through effective biosecurity plans and measures
- Avoid fragmentation of agricultural lands, incompatible development and urban encroachment of farm land particularly during drought
- Pre-plan for temporary waste needs to respond to disaster

INDICATOR METRICS

- Number of environmental and sustainability programs in schools
- Groundcover and topsoil retention
- Number of reported biosecurity concerns
- Extent of scouring and bank erosion
- Performance against regional water plans

THEME: CARE FOR HEALTHY COUNTRY

SYSTEM PRIORITIES

We value and protect natural processes, ecosystems and biodiversity
 We work together to heal Country
 We invest in cultural land management practices

STRATEGIES

Everyone:

- Indigenous knowledge, connections and practices are respected
- Indigenous agency, capacity and capability to manage Country is supported
- Cultural burning programs are implemented, providing key training opportunities for Indigenous fire practitioners
- Understanding of Indigenous weather characteristics of the region is developed and shared
- Rehabilitation programs are undertaken to restore and heal vegetation communities
- Biodiversity values are protected from incompatible land uses and activities
- Hazard mitigation measures are considered on balance with ecological functions and values
- Agencies and communities work together to develop property-focused disaster plans and management plans

INDICATOR METRICS

- First Nations leadership and representation in land management programs
- Number of Cultural land management programs
- Regional performance against biodiversity indicators for NSW
- Water quality indicators
- Biological indicators such as fish and macroinvertebrate density, benthal algal growth and benthic oxygen demand

THEME: CLIMATE CHANGE INNOVATION

SYSTEM PRIORITIES

We do things differently to promote diverse natural environments that withstand or adapt to climate impacts

We harness innovative approaches that reduce human impacts

STRATEGIES

For people and communities:

- Energy and fuel consumption is reduced
- Recycling, re-purposing and waste minimisation approaches are adopted
- Water-saving behaviours are adopted
- Volunteer to support environmental groups

For businesses, service agencies and organisations and governments:

- Climate transition is led by decarbonisation policies and action
- Supporting infrastructure for technological advancement and energy security during transition to net zero is provided
- Coastal zones are monitored, and measures are deployed at appropriate times to address coastal risks
- Erosion management measures are deployed
- Recycling, re-purposing and waste minimisation approaches are adopted
- Renewable energy investment including wind, solar, biofuels and hydrogen is prioritised
- Carbon market and biodiversity offsets opportunities are explored
- Research investment is leveraged to inform decision-making
- Sector and industry-led approaches to climate innovation and net-zero transition are championed

INDICATOR METRICS

- Regional performance against the metrics established by the NSW Climate Change Adaptation Strategy
- Regional delivery of infrastructure in accordance with the net zero and natural endowments objectives of the State Infrastructure Plan

BUILT ENVIRONMENTS AND INFRASTRUCTURE

Our built environment (dwellings, towns and centres) and infrastructure networks form part of the foundation of our resilience. Whilst they can offer refuge and provide services upon which we rely, we must be aware that they too can experience disruption and failure. This can present a complicating factor because of the degree to which today's society relies upon infrastructure and technology which is amplified during emergencies. Planning for built environment and infrastructure resilience in a changing climate is key.

Theme 1: Risk-based land use planning

The 2015 Productivity Commission into Natural Disaster Funding Arrangements states that 'land use planning is perhaps the most potent policy lever for influencing the level of future disaster risk'. The Planning Institute of Australia notes the benefits of a focus on disaster resilience in land use planning, including anticipating risks before they happen and developing the built form to address those risks, minimising risks to people and social and economic functions, and translating learnings from recovery to improve settlement durability (AIDR, 2020).

Adopting risk-based approaches across the spectrum of land use planning practices and processes will help arrest existing risk exposure and work to avoid unacceptable risk outcomes. Factoring in climate projections and how we adapt into the future lies at the core and approaches span the policy, strategic and development assessment spectrums.

Theme 2: Buildings, facilities and places

The resilience of places where we live and work and their ability to stand up to different weather events and impacts is critical. How we deal with extreme heat now and into the future is a challenge, but one with many opportunities which also enhance liveability. Equipping public buildings, facilities and places to adapt to diverse conditions will enable their function across a broad set of circumstances.

Likewise, equipping our homes and properties to adapt to different circumstances and needs is also important. This may involve retrofitting and maintaining existing homes, how we design new homes to be sustainable and resilient, and how we maintain them and the surrounding property, can greatly aid their ability to withstand.

Theme 3: Resilient and sustainable infrastructure

Infrastructure assets and networks provide the platform for much of our human interaction, whether it be physical connectivity via roads, air, sea or rail, or telecommunications and digital connectivity or the operation of essential services like water supply and sewerage, the reliability and resilience of infrastructure assets and networks is pivotal.

This is reflected by the State Infrastructure Strategy and the need to embed reliability and resilience as one of 9 key objectives. This extends to whole-of-lifecycle considerations including asset management and continuity planning.



RENEWABLE ENERGY

“

We need to see more happening in every way to counter the adverse effects of climate change, better soils, conserving quality water, a faster shift to renewable energy and cheaper electricity, reducing and recycling waste... there is so much that can be done including an emphasis on faster planning and implementation of better measures. - Goulburn Mulwaree resident

”

EXAMPLE APPROACHES FROM ACROSS THE REGION

Long-standing flood resilience programs to boost resilience like that implemented in Cooma over the past 70 years contribute to enhanced resilience, risk and economic outcomes. Channel improvements and a levee system to protect against frequent flood events are complemented by investments in flood warning infrastructure assets and land use planning policies with a focus on compatibility with levels of flood hazard. The Snowy Monaro Floodplain Risk Management Studies and Plans are the next generation approach, building on a resilience legacy dating back to the 1950s.

More frequent periods of extreme heat require new approaches to manage heat-related risks and the impacts of urban heat island effect. Wingecarribee Shire Council's 'Climate Change Adaptation Plan', Queanbeyan-Palerang Regional Council's 'Keeping it Cool - vegetation and heat adaptation strategy' and Goulburn Mulwaree Council's Climate Change Assessment and Adaptation Initiatives include measures to increase community resilience to extreme heat, as well as other climate risks.

Eurobodalla Shire Council's Infrastructure Resilience Plan was informed by the experience and lessons learned from major bushfires including the 2019-20 Black Summer bushfires as well as almost ten significant flood events over recent years. Its focus is directed to reducing community impact as well as risks to first responders and early recovery teams.



TOOLS FOR SUPPORT

For people and communities:

- [Bushfire-Resilient Housing Toolkit](#) prepared by the Canberra Region Joint Organisation
- [Building in a Bushfire Prone Area and Planning for Bushfire Protection](#) prepared by the NSW Rural Fire Service
- [Your Home: Creating sustainable homes for the future available](#) from the Commonwealth Government
- [Future Homes program](#) from the Green Building Council Australia
- Council Local Strategic Planning Statements, Local Environmental Plans, Development Control Plans, Infrastructure and Asset Management Plans

For service agencies, organisations and governments:

- [Bushfire-Resilient Housing Toolkit for Councils](#) prepared by the Canberra Region Joint Organisation
- [Australian Institute for Disaster Resilience \(AIDR\) Handbook Collection:](#)
 - Evacuation planning
 - Land use planning for disaster resilient communities
 - Flood emergency planning for disaster resilience
 - Managing the floodplain
 - National Emergency Risk Assessment Guidelines
 - Systemic disaster risk
- [Risk-based Land Use Guide](#) prepared by the United Nations
- [NSW Climate Adaptation Strategy](#) prepared by AdaptNSW
- [A Pathway to Infrastructure Resilience](#) prepared by the Commonwealth Government
- [State Infrastructure Strategy](#) prepared by the Infrastructure NSW

- [NSW Critical Infrastructure Resilience Strategy and Guide](#) prepared by Resilience NSW
- [Building Resilient Infrastructure](#) prepared by the Australian Business Roundtable for Disaster Resilience and Safer Communities
- [Resilience Planning](#) available from the NSW Government
- [Strategic Planning for Natural Hazards in NSW](#) available from the NSW Government
- [Flood-prone land package](#) prepared by the NSW Government
- [Floodplain Development Manual](#) prepared by the NSW Government
- [Planning for Bushfire Protection 2019](#) prepared by the NSW Rural Fire Service
- [Coastal Management Framework](#) available from the NSW Government
- [Urban Heat Planning Toolkit](#) prepared by the Western Sydney Regional Organisation of Councils
- [Enabling Resilience Investment](#) available from the CSIRO
- [NSW Spatial Digital Twin](#) available from the NSW Government



BUILT ENVIRONMENT AND INFRASTRUCTURE RESILIENCE DIRECTIONS

THEME: RISK BASED LAND USE PLANNING

SYSTEM PRIORITIES

We drive sustainable settlement patterns and land use allocation
We plan for natural hazards and risk as a foundation

STRATEGIES

Governments:

- Integrate the consideration of climate change as part of risk analysis activities for land use planning. This relates to risks that are identified today as well as what may be required in the future
- Undertake risk assessments and scenario testing across hazards that considers exposure, vulnerabilities and stress factors (sensitivities)
- Investment and economic development is directed to lower risk locations and circumstances
- Strategic planning ensures land is zoned to avoid higher risk locations and potential circumstances
- Forward-focussed settlement adaptation approaches are explored for high risk locations
- Consider risk elements such as evacuation when analysing growth options
- Deploy statutory tools to derive appropriate settlement pattern outcomes, like ensuring lot sizes are appropriately matched to intended risk-based objectives
- Consider First Nations knowledge, local knowledge and risk analysis was part of information gathering processes to inform decisions
- Regional planning is undertaken using a risk-based approach as a baseline principle, with a focus on resilience
- Employ effective data management processes
- When disruption, damage or loss occurs, we build back better. This may include retreat/relocation to lower-risk locations or circumstances

INDICATOR METRICS

- Extent of exposure of people and property in higher risk in growth areas
- Risk considerations are embedded in all land use decisions including policy, strategic planning and development assessment
- Consideration of risk occurs early in planning processes
- Updates to and new planning instruments such as regional plans and Local Strategic Planning Statements prioritise the consideration of risk
- Property damage and loss data
- Tools are deployed to address risk legacy in existing communities
- Natural systems and processes are maintained through planning processes
- Risk data and intelligence is maintained in perpetuity
- Monitoring and review of decisions processes in place
- Managed retreat plans and pre-planning for post-disaster impacts are in place



THEME: BUILDINGS, FACILITIES AND PLACES

SYSTEM PRIORITIES

We invest in resilient buildings
 We provide multi-purpose public facilities
 We provide quality community spaces for health and wellbeing

STRATEGIES

For people and communities, businesses, service agencies and organisations:

- New buildings are designed and constructed in accordance with resilience and sustainability principles
- Adequate insurance for buildings and contents is assessed annually
- When disruption, damage or loss occurs, we build back better. This may include retreat/relocation to lower-risk locations or circumstances

For governments:

- Sustainability standards for new homes and buildings are strengthened
- Existing and new public facilities are designed and constructed in accordance with accessibility, resilience and sustainability principles
- Multi-purpose public facilities incorporate the potential to service refuge, evacuation and/or recovery / community hub needs, including the needs of vulnerable persons
- Public facilities that may provide a refuge, evacuation and/or recovery/community hub purpose are equipped with generators, solar power, Wi-Fi, telecommunications receivers, emergency food and water supplies, first aid equipment, chain saws and other tools
- The ability for public facilities to provide heat refuge and respite for the community and vulnerable persons is considered
- Urban design and water sensitive urban design (WSUD) principles for building and public realm performance during periods of extreme heat are employed, supported by heat mapping
- Retrofit existing buildings and facilities with energy efficient lighting and appliances, installing insulation, ventilation and security for use at night time
- Work with ACT Housing to monitor and provide information on regional vulnerability and the CRJO Housing Toolkit
- Wi-Fi and device recharge stations are contemplated as part of new public spaces, including fixed and transportable options
- When disruption, damage or loss occurs, we build back better. This may include retreat/relocation to lower-risk locations or circumstances

INDICATOR METRICS

- Data on the implementation of the CRJO Housing Toolkit
- Number of properties in the region that are under-insured or not insured
- Performance against building sustainability indicators
- Number of public buildings serviced by generators and solar
- Number of identified heat refuges
- Extent of urban canopy cover
- Urban heat mapping data
- Number of public buildings fit for evacuation or refuge use, including accessibility
- Number of community hubs that offer multi-purpose options
- Managed retreat plans and pre-planning for post-disaster impacts are in place



THEME: RESILIENT AND SUSTAINABLE INFRASTRUCTURE

SYSTEM PRIORITIES

We focus on system, network and asset redundancy
 We value durability and reliability
 We employ innovation to provide continuity of service

STRATEGIES

Service agencies, organisations and governments:

- Climate risks to systems, networks and assets are identified and addressed
- Assets that support regional, state-wide or national services or networks are identified and prioritised for risk management
- Betterment as the norm, rather than the exception
- Resilience 'premiums' are accepted as normal practice. New infrastructure and upgrades incorporate resilience as a baseline component of design and construction
- When disruption, damage or loss occurs, we build back better. This may include retreat / relocation to lower-risk locations or circumstances
- Multiple energy generation opportunities can provide a level of network redundancy
- Mobile blackspots across the region are addressed, supporting social and economic needs as well as in times of emergency
- Back-up power sources are provided for telecommunications assets across the region, and temporary facilities are positioned around the region
- Resilience needs and benefits are factored into long-term asset management plans and capital expenditure programs
- Enduring investment is allocated for flood warning infrastructure assets and networks, as well as other early warning systems (where appropriate)
- Asset owners (including government) provide asset metadata to the NSW Spatial Digital Twin and emergency services, updated annually
- Asset protection and access roads for critical infrastructure are maintained on an annual basis
- Higher risk and vulnerable infrastructure assets like electricity is provided underground
- Manage roadside vegetation using a risk-based approach and balanced with broader land use and biodiversity needs

INDICATOR METRICS

- Number of critical infrastructure assets in higher risk locations
- Responsibilities for asset and risk management are confirmed
- Contingency plans for assets and services are in place
- Regular reporting through emergency management frameworks takes place
- Asset data and interdependency information is shared
- Build back better approaches are embedded in asset management plans
- Managed retreat plans and pre-planning for post-disaster impacts are in place
- Mobile blackspot areas are reduced
- Flood warning assets are supported by long-term maintenance plans and activities
- Resilience is embedded into business cases and avoided loss data is shared



THE ECONOMY

Economic resilience is a crucial element with strong inter-relationships and inter-dependencies across multiple system environments. The function of local and regional economies underpins our social resilience. Economic resilience can unlock opportunities and provide a form of stability during change and uncertainty.

During times of recovery, efficient grant management is required, making it easier for businesses to navigate and seek support and ensuring appropriate use of funds.

Theme 1: Diversification and innovation

From a governance perspective, economic resilience is related to welfare impacts based on the ability for the economy to cope and recover and can be influenced by policies aimed at prevention and mitigation (World Bank, 2014 and OECD, 2017). Economic growth is a widely-held aspiration that underpins liveability, and can be impacted significantly by shocks and stresses.

Local and regional economic diversification and a focus on innovation is a key opportunity to strengthen performance, and mitigate against volatility.

Theme 2: Enterprise resilience

The COVID-19 global pandemic saw widespread shifts to adapt to rapidly changing circumstances. Some enterprises were able to pivot and some even prospered whilst others did not. Enterprise risk management and continuity planning is critical to any business operation. Business will be interrupted. Having a plan can provide control over decision-making.

From a community and governance perspective, the health of local businesses is a priority, supporting our access to goods and services to meet needs and to ensure whole-of-community opportunities to thrive in the longer term. Access to employment and income are crucial during times of shock and stress.

Theme 3: Climate-ready economy

Climate-ready economies are those which understand their risks, take steps to avoid or minimise the impacts of those risks and take advantage of emerging market opportunities and innovations. Whilst changes in practices will be required as Australia navigates toward net zero emissions, there are many benefits that coincide with new emerging markets and increased investment.

“

These disasters are going to get worse. We need a proper go-to plan for preparing and then managing our way through them.

- Yass business representative

”

“

I have no idea how to be better prepared. Even worse, I have no idea where to find that information to change the fact that I don't know.

- Eurobodalla business representative

”



EXAMPLE APPROACHES FROM ACROSS THE REGION

The CSIRO's 'Enabling Resilience Investment' approach is being piloted in the Bega Valley and focuses on planning for an adaptive future following cumulative events over recent years across drought, bushfires, floods and pandemic. CSIRO, Value Advisory Partners and the University of Adelaide are working with a range of participants including local government, businesses, communities and NSW Government agencies to identify and assess investment opportunities in disaster risk reduction and sustainable development for a resilient Bega Valley.

The Snowy Monaro business and recovery hub is a partnership between Business Australia and Snowy Monaro Regional Council. The Hub is supported by a co-contribution between the NSW and Australian Governments through the Bushfire Community Recovery and Resilience Fund. The hub works with small business owners on their current operating issues and business happenings, providing linkages and solutions, understanding the grants that are available, what current and potential challenges are for the business and how to continue to build resilience into their business.

The Rural Financial Counselling Service focus on supporting a sustainable, resilient and profitable primary production sector. With skillsets in commercial farming, industry, business, banking and commodities, the Rural Financial Counselling Service offer business support services for rural enterprises across a broad spectrum of elements from business models, capital and finance to risk management networks and exit planning.



TOOLS FOR SUPPORT

For businesses and private sector organisations:

- [Business continuity toolkit](#) prepared by Service NSW
- [Five lessons to ready your business and support community resilience](#) prepared by the Australian Business Roundtable for Disaster Resilience and Safer Communities
- [Building small business resilience](#) prepared by the Small Business Commissioner
- [Find disaster recovery services and support](#) provided by the National Recovery and Resilience Agency
- [Service NSW for Business](#) provided by the NSW Government
- [What to do immediately after a disaster](#) available from CPA Australia
- [Guidance for business: To help reduce climate and disaster risk](#) prepared by the Department of Home Affairs

For government:

- [Special report: Update to the economic costs of natural disasters in Australia](#) prepared by the Australian Business Roundtable for Disaster Resilience and Safer Communities
- [Enabling Resilience Investment](#) available from the CSIRO
- [Enabling Resilience Investment tools, products and services](#) available from the CSIRO
- [A Blueprint to Grow Structured Giving](#) prepared by Philanthropy Australia
- [Resilience Valuation Initiative](#) established by the Australian Business Roundtable for Disaster Resilience and Safer Communities
- Natural Hazards Research Australia economic analysis tools:
 - [Economic Analysis Screening Tool](#)
 - [Value Tool for Natural Hazards](#)

ECONOMIC RESILIENCE DIRECTIONS

THEME: DIVERSIFICATION AND INNOVATION

SYSTEM PRIORITIES

We harness a diverse economic base
We invest in enabler technologies and innovation

STRATEGIES

For businesses and private sector organisations:

- Business-based opportunities for diversification are explored and embedded, providing multiple income streams
- New approaches, practices and innovations are harnessed, providing first-mover advantage
- New technologies are explored

For governments:

- Diverse economic development growth and diversification strategies are developed and implemented
- Incentives for business attraction are considered
- Opportunities for specialisations that diversify smaller centres from others are advanced
- Changing market forces are anticipated and planned for, support and information is provided for small medium enterprises
- Enabling infrastructure to support digital enterprise is a focus area for investment

INDICATOR METRICS

- Percentages of market share across industry
- Number of local businesses
- Proportion of industries by employment and income
- Industry composition
- Gross Regional Product
- Unemployment data
- Number of local jobs
- Economic development plan implementation
- Support for economic diversification through feasibility studies

THEME: ENTERPRISE RESILIENCE

SYSTEM PRIORITIES

We proactively plan for business continuity, and disaster disruption is part of the plan

STRATEGIES

For businesses and private sector organisations:

- Adopt a positive outlook on future market share and enact measures for growth
- Risks that may effect the operations, finances or objectives of the business are identified and mitigation measures are put in place
- Business continuity plans are developed, and disaster disruptions form part of the plan
- Involve employees in business continuity planning to enhance mutually-understanding of needs and limitations
- Adequate insurance is secured for business assets
- Understand the risk associated with the supply chain networks upon which business relies to identify redundancy measures
- Collaborate and partner with complimentary businesses and service providers in the area
- Financial reserves and positive cash flow is built over time
- New technologies are explored
- Adopt an entrepreneurial mindset to recovery, and consider business recovery mechanisms in advance of a shock or stress occurring
- Explore recovery pathways that suit business needs such as adapt or change, pivoting, smoothing cash flow, capitalising on short-term opportunity, or downshifting

For governments:

- New technologies and industry needs are contemplated and integrated into planning frameworks and infrastructure plans, unlocking growth potential and catalysing investment
- Contribute to conditions that support dynamic business networks and regional business ecosystems with complimentary capacities
- Consider the ease with which businesses can access resilience and recovery support, including grants and make these processes a streamlined and easy to navigate as possible
- Consider the needs of diverse business representatives including First Nations businesses, and business operated by and for CALD communities and persons with disabilities

- Consider local, regional, state and national (and international) supply chain network vulnerabilities and proactively introduce redundancy measures
- Consider recovery pathways for local businesses in anticipation of events
- Ensure support is available for businesses that are indirectly impacted, recognising indirect impacts are also significant
- Ensure business and business representative diversity in economic resilience and recovery consultation processes
- Support for start-ups (less than 3 years operating) and micro-business is enabled

INDICATOR METRICS

- Economic losses from disasters
- Proportion of business operations with enterprise risk management and business continuity plans that include disaster and climate risk
- Business and economic data during and after shocks and stresses
- Participation in industry groups and chamber of commerce and other business networks and associations
- Participation levels in grant skills workshops
- Economic development plan implementation
- Establishment and operation of economic development committees



THEME: CLIMATE READY ECONOMY

SYSTEM PRIORITIES

We manage economic risks and position for opportunities in a changing climate

STRATEGIES

For businesses and private sector organisations:

- Climate-risks are considered from a business and economic perspective
- Changes to investor expectations and global markets are anticipated and plans are in place to support adaptation
- Shifts toward net zero emissions are enacted over time
- Employment programs focus on retraining and up skilling of the workforce over time
- Decarbonisation is anticipated and its economic changes, including cascading changes, are anticipated and opportunities are leveraged
- Circular economy opportunities are leveraged
- Carbon pricing is contemplated as part of the movement to a carbon constrained economy
- Technological development is embraced

INDICATOR METRICS

- Greenhouse gas emissions
- Number of enterprises with net zero and sustainability plans in place
- Number of enterprises with transition risk plans in place
- Expenditure on transition and environmental protection
- Changes in sector emissions shares
- Waste generation data
- Regional performance against the metrics established by the NSW Climate Change Adaptation Strategy

LEADERSHIP AND STRATEGY

How we collectively demonstrate resilience leadership and navigate towards continuous improvement over time, whilst complex, can be driven by a clear set of principles:

- multi-dimensional approaches, which view issues through different resilience ‘lenses’ including human and social, economic, environmental, built environment and infrastructure
- cross-disciplinary effort which brings a range of experiences, knowledge and ideas in contribution to different resilience issues
- local leadership and championship of resilience-related efforts
- flexibility and agility to explore relevant issues and adapt to emerging knowledge and information
- fostering a resilience mindset as part of business as usual practices.

Now more than ever, a strength of leadership that is underpinned by strategic direction is necessary.

Theme 1: Emergency management and recovery

Climate-related risks are testing our emergency management and recovery systems and processes. Our resources are being stretched and the management of these resources requires re-focus to deal with tomorrow’s challenges.

We also know the duration of recovery processes is long, if ever in some cases. A greater understanding of communities in trauma is needed. Recovery support is required for longer, and requires coordination and collaboration in a manner that respects and integrates locally-led solutions.

Theme 2: Resilience investment

Deloitte Access Economics (2022) models the total economic costs of disasters in NSW from 2020-2060 to be between \$320-\$391 billion, depending on emissions scenarios. Even in a low emissions scenario, which we are not on track to achieve, this is a cost to NSW that is unsustainable.

Supplementing our emergency services capabilities and equipment to respond is one option, but this does not deal with the root causes of our disaster risks. We also need to focus on knowing and understanding our risks and doing something about them whilst we can, before circumstances and conditions overtake that ability.

How we grow resilience to climate-driven disaster risk is not only one of the defining challenges of our time, but one of our greatest opportunities.

Theme 3: Partnerships and collaboration

We have a need to work better, together.

One of the most widely acknowledged opportunities for growing resilience, recognised across South East NSW by residents, businesses, community groups, service agencies and organisations as well as government representatives, is the need for improved:

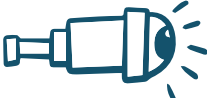
- connection
- collaboration
- coordination.

These things are not necessarily easy or time efficient, but they are valuable and necessary.

“

We need leaders who are futures-system literate, inclusive, ethical, informed, representative, and able to operate courageously.
- Resilience Blueprint workshop participant

”


POLICY & STRATEGY
WITH A FUTURE FOCUS 

EXAMPLE APPROACHES FROM ACROSS THE REGION

The Batlow Preparedness Plan is a Resilient Towns Initiative driving a locally-led approach towards making Batlow in the Snowy Valleys LGA a safer community in the event of a future disaster. With the benefit of national and internal resilience expertise, the plan is a two-year project that supports Council and surrounding local communities in the Snowy Valleys towards strengthening resilient towns. The project is funded by the NSW Government.

The Bywong and Wamboin Building Community Resilience program is about better connections between people and local neighbourhoods in Bywong and Wamboin. These connections create a foundation for local safety, sharing local knowledge and help when needed, to ensure living a rural residential life can be a rewarding and sustaining experience in uncertain times. The program builds on two existing initiatives—the Community Firewise Groups and the public walks program on the Greenways. To support those two initiatives, a community leadership program will help volunteers who may want to lead public walks, offer to be a Firewise convener or to step up in other ways to assist the community.

The Southern NSW Drought Resilience Adoption and Innovation Hub is a consortium of nine regional partners including primary producers, Indigenous, industry and community groups, researchers, entrepreneurs, education institutions, resource management practitioners and government agencies. Housed at Charles Sturt University AgriPark in Wagga Wagga, the hub focuses on combating drought through user-driven innovation, research and adoption to facilitate transformational change in drought resilience across Southern NSW.

The 'Regenerate Capital Region' is a leadership development program in response to the 2019-20 bushfire season. Its objective is to build a network of trusted contacts across geographical boundaries and agencies to better respond to future fire emergencies. It aligns with the National Strategy for Disaster Resilience's focus on achieving community resilience through collective and shared responsibility and empowering individuals and communities to create change, and is delivered by the Australian Rural Leadership Foundation.

Yass Habitat Linkages is a 10 year project funded by the NSW Environmental Trust through a partnership between the Yass Area Network of Landcare Groups, Greening Australia, the Australian River Restoration Centre, Land for Wildlife, Local Land Services and Yass Valley Council. The project focuses on restoring wildlife habitat and vegetation across a valued productive agricultural landscape. The project enables landholders to enhance biodiversity and improve sustainable farming in the Yass region by helping to create corridors of native vegetation across the landscape, with over 53 landholders participating.

TOOLS FOR SUPPORT

- [How to Make Cities More Resilient: A handbook for local government leaders](#) prepared by the UNDRR
- [2020 Royal Commission into National Natural Disaster Arrangements](#) available from the Commonwealth Government
- [2020 NSW Bushfire Inquiry](#) available from the NSW Government
- [2022 Select Committee on the Response to Major Flooding across NSW in 2022](#) available from the Parliament of NSW
- [Australian Disaster Resilience Handbook Collection:](#)
 - Australian emergency management arrangements
 - Community engagement for disaster resilience
 - Community recovery
 - Disaster resilience education for young people
 - Emergency planning
 - Flood emergency planning for disaster resilience
 - Health and disaster management
 - Land use planning for disaster resilient communities
 - Lessons management
 - Managing the floodplain
 - National emergency risk assessment guidelines
 - Public information and warnings
 - Safe and healthy crowded places
 - Systemic disaster risk
- [Guidance for Strategic Decisions on Climate and Disaster Risk](#) prepared by the Australian Institute for Disaster Resilience
- [Profiling Australia's Vulnerability](#) prepared by the National Resilience Taskforce
- [Best Practice Guidelines: Supporting communities before, during and after collective trauma events](#) prepared by the Australian Red Cross
- [Coping after a crisis](#) prepared by the Australian Red Cross
- [Strengthening Your Community's Resilience](#) prepared by the Australian Red Cross

LEADERSHIP AND STRATEGY RESILIENCE DIRECTIONS

THEME: EMERGENCY MANAGEMENT AND RECOVERY

SYSTEM OBJECTIVES

We proactively concentrate on emergency management and recovery preparations

PRIORITY STRATEGIES

Everyone:

- Implementation of findings and recommendations from Commissions and Inquiries is delivered
- Lessons learned processes are adopted, and are used to engender better approaches
- Effort and time to coordinate processes are provided
- Capability and capacity is a continued area of development
- Local and district emergency management plans are clear and embrace First Nations knowledge, local knowledge and western science
- Data intelligence is used to inform decision-making
- Pre-planning for post-disaster recovery and reconstruction
- Respect for locally-led recovery needs forms the basis of recovery efforts
- Local solutions to local issues and shared solutions to shared challenges are prioritised
- Momentum generated from recovery is leveraged into resilience with consistency of funding

INDICATOR METRICS

- Changes to processes attributed to lessons learned, Commissions and Inquiries
- Roles in emergency are clear
- Emergency response training and exercising
- Recovery processes are locally-led, state and service supported
- Plans in place which respond to post-disaster needs
- Additional resilience roles funded

THEME: RESILIENCE INVESTMENT

SYSTEM OBJECTIVES

We invest time, effort and dollars to strengthen resilience to current and future risks

PRIORITY STRATEGIES

Everyone:

- Organisational resilience is embraced
- Resourcing, funding coordination and consistency for local government is enhanced
- Investment in partnerships and collaboration between local government and communities is supported
- Betterment is the norm, rather than the exception
- Investment in data, monitoring and intelligence to inform decision making is enhanced
- Resilience funding is oriented to need, which includes growing social and environmental needs
- Capability and capacity is a continued area of development
- Climate change is factored into governance mechanisms
- Resilience and climate-risk considerations are factored into business as usual processes
- Climate legal risk is understood and climate scenarios are developed, tested and inform risk management approaches
- Resilience is factored into government financial planning activities
- Global drivers and trends that may affect transition risk are explored and analysed
- Lessons learned help inform where future funding is directed
- Legislative and regulatory reform enhances innovation by removing red tape

INDICATOR METRICS

- Disaster and climate risks are studied to inform strategic planning
- Integration of the Resilient Blueprint directions into local government IPR&R activities
- Regional and state-level plans and strategies for the region are informed by the directions of the Resilience Blueprint
- Resilience directions are actively delivered through implementation pathways
- Local resilience activities link to state and national disaster risk reduction, climate frameworks and strategies
- Regional performance against the metrics established by the NSW Climate Change Adaptation Strategy

THEME: PARTNERSHIPS AND COLLABORATION

SYSTEM OBJECTIVES

We work together to deliver 'joined-up' approaches that are coordinated and collaborative

PRIORITY STRATEGIES

Everyone:

- Partnerships and collaboration between local government and communities is supported
- Respect for locally-led recovery needs forms the basis of recovery efforts
- Capability and capacity is a continued area of development
- The translation of plans into understandable concepts is a focus of all levels of government
- All levels of government work with the insurance industry to examine risk and explore options and opportunities that limit
- Information regarding disaster and climate-related risk is shared
- Lessons learned help inform where future efforts are directed
- Coordination across levels of government and between departments is enhanced

INDICATOR METRICS

- Participation in partnerships, communities of practices, industry groups
- Public participation in decision-making processes
- Number of resilience-related capability and capacity programs, including leadership program
- UNDRR resilience scorecard for cities is deployed as a measure



SECTION 2



THE SOUTH EAST NSW RESILIENCE ASSESSMENT

OUR LANDSCAPES, PEOPLE AND PLACES

A key element of how we identify ourselves and our values stems from where and how we live, the characteristics by which our varied communities across South East NSW have formed and continue to thrive.

The Blueprint spans 11 local government areas including Bega Valley, Eurobodalla, Goulburn-Mulwaree, Hilltops, Queanbeyan-Palerang, Snowy Monaro, Snowy Valleys, Upper Lachlan, Wagga, Wagga, Wingecarribee and Yass. Our region is centred around the nation's capital of Canberra which itself is home over 400,000 people. Opportunities for collaboration across borders, not only with Canberra but Victoria to the south, have and continue to be fundamental to many aspects of how we live, work and play.

OUR LANDSCAPES

First Nations Australians were the first inhabitants of the region, and maintain enduring deep spiritual, cultural and physically connection with Country.

The South East and Tablelands Region spans the coastline from Durras Lake near Batemans Bay to the Victorian border. The south-eastern corner of NSW is home to Australia's highest summits, including Mount Kosciuszko and Mount Townsend, and the headwaters of the Snowy, Murray, Murrumbidgee and Lachlan rivers. Well known for its beaches, the South East and Tablelands Region includes enclosed beach compartments as well as large coastal embayments such as Batemans Bay. It stretches inland, taking in Wagga Wagga which forms the most eastern part of the Riverina district and is NSW's largest inland city (AdaptNSW, 2014).

The region's landscapes have different ecological and productive characteristics which over time, have driven where and how our townships and economic activities have developed since European settlement. South East NSW is popularly known for its diverse landscapes which are influenced by their unique land formations, geologies and climates.

COAST



ALPINE SLOPES



TABLELANDS



Today, the picturesque natural environments, pristine waterways and clean air within these landscapes attract residents and visitors alike, drawn by access rugged bushland, mountain hiking, coastal adventures, inviting and unique rural towns and great weather. Communities across the South East region are passionate about protecting the natural environment and its landscapes, volunteering their time to help preserve them.

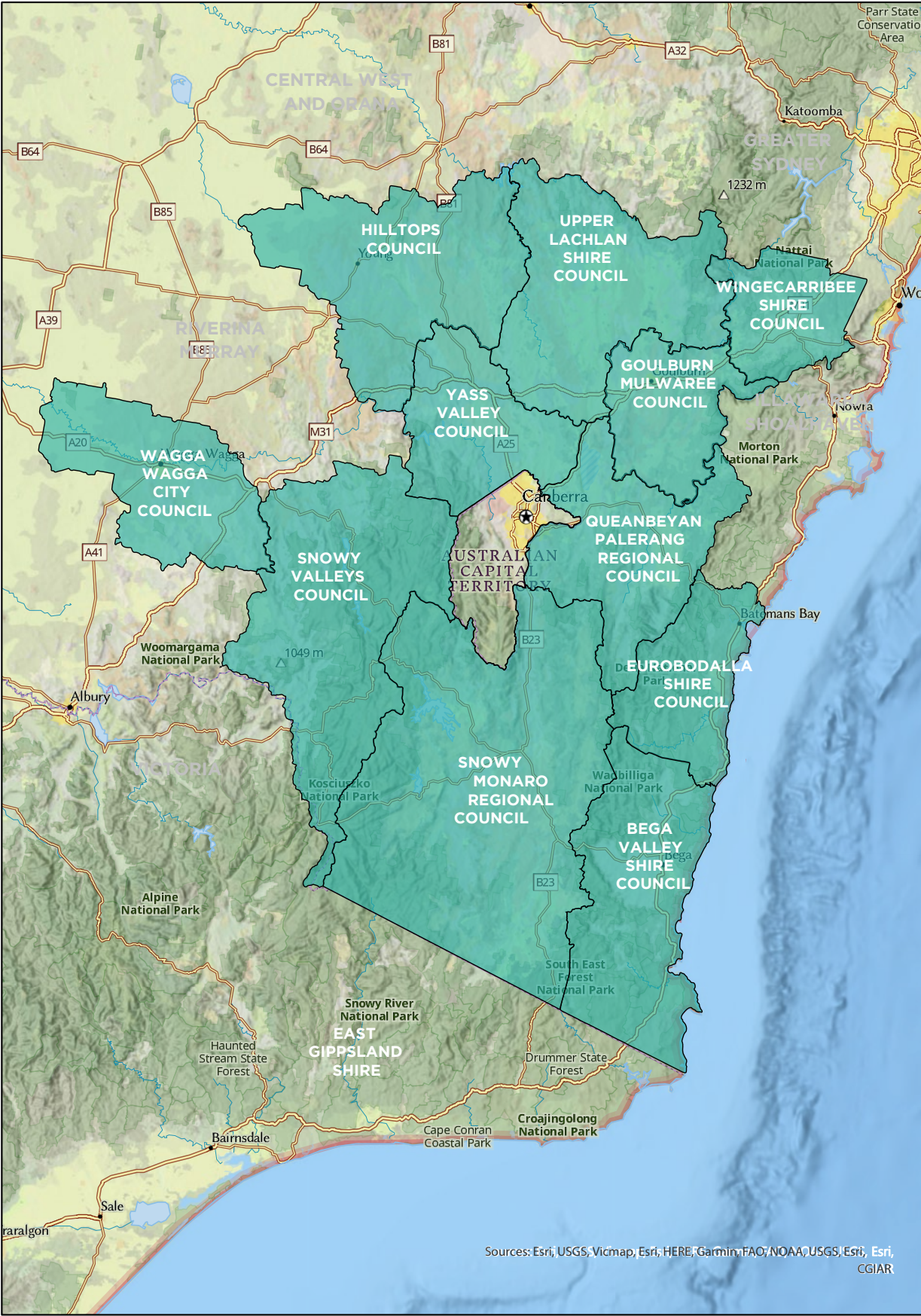
Kosciuszko National Park is NSW's largest national park and home to Australia's highest peak, Mount Kosciuszko. Mount Kosciuszko is renowned for its world-class ski resorts, ghostly snow gums and the famous summit walk to the highest point in Australia. Yarrangobilly Caves is at the northern end of the national park. Its limestone dates back 440 million years (Visit NSW, 2022). The alpine ecosystem is home to unique biodiversity and is a haven for threatened species.

Tall old-growth forests, waterfalls and escarpments are dotted throughout the national parks of the Sapphire Coast, with mixed ecosystems protected across nature reserves, state forests and national parks to the west through the Snowy Valleys.

The region's landscape importantly underpins aspects of First Nations cultural heritage connection with protected features such as Lake George sand deposits, Gulaga and Biamanga national parks, remnant vegetation within roadside corridors and travelling stock reserves (NSW Government, 2017).

The southern tablelands and south-eastern slopes contains many temperate grassland, woodland, wet forest and alpine ecosystems, and plant and animal species not found elsewhere in NSW. There are internationally significant (Ramsar) wetlands such as Blue Lake in the Snowy Mountains. Significant protected areas include Kosciuszko National Park, the South East Forests and Deua-Wadbilliga national parks on the escarpment, and Nadgee Nature Reserve on the far south coast. The state's only pristine estuary, Nadgee Inlet, is located in the region. These biodiversity hotspots are also significant cultural landscapes for the region's First Nations peoples (AdaptNSW, 2014).

The topography of the South East NSW region results in a large range of climates. It is relatively wet close to the coast and Snowy Mountains, and drier inland. It is hot in summer in northern inland areas and very cold in winter in the Snowy Mountains. Milder conditions are found along the coast, with cooler temperatures in summer and warmer temperatures in winter (AdaptNSW, 2014).



OUR PEOPLE

In 2021 the Aboriginal and Torres Strait Islander population was estimated at 4 per cent of the region's population, an increase of 2,816 people from the 2016 Census estimate data.

The region's 11 LGAs accommodated an estimated population of 373,533 residents in 2021, an increase of 25,244 people or 9 per cent since 2016¹. This is consistent with a general regional migration shift as a result of the COVID-19 global pandemic.



Across the region, with the exception of Wagga Wagga, the largest changes in the age structure between 2016 and 2021 were in the following age groups:

- 8,880 more seniors (70 to 84)
- 5,199 increase in young workforce (25 to 34)
- 3,478 additional empty nesters and retirees (60 to 69)
- 1,752 more parents and homebuilders (35 to 49) (.id community 2022).

The region continues to experience a lower proportion of people in the younger age groups (0 to 17 years) compared to wider regional NSW (.id community 2022).

13 per cent of the population were born overseas and 6 per cent spoke a language other than English at home in 2016. The largest changes in the spoken languages of the population in the region between 2011 and 2016 were for those speaking Mandarin, Punjabi, Nepali and Filipino / Tagalog. However, the top three languages spoken in the region in 2016 were Italian, German and Macedonian (.id community 2022).

The CRJO region's land area of 63,319km² accommodates 148,336 dwellings with an average household size of 2.39. In 2021, 69 per cent of households were purchasing or fully owned their home, 19.1 per cent were renting privately, and 2.7 per cent lived in social housing. The total number of households in the region increased by 11,546 between 2016 and 2021, most of which were purchasing or fully owned their home (.id community 2022).

The largest household type in the region is couples without children, at 29.7 per cent, and couples with children at 24.9 per cent. However the largest changes in family / household types in the region between 2016 and 2021 were couples without children (+4,194 households) and lone person (+3,208 households) (.id community 2022).

1 With the exception of the Wagga Wagga LGA which is an affiliate member of the CRJO.

In 2021, 18,208 people (or 5.9 per cent of the population) in the region reported needing help in their day-to-day lives due to disability, which is a similar percentage to 2016. 36.7 per cent of the population reported to have at least one long-term health condition, with the top conditions being arthritis, a mental health condition and asthma.



The region's community strategic plan notes some social issues in the region include building community cohesion and connection, ensuring that diversity and inclusion are fostered, including the recognition of First Nations people, and mitigating the impact of alcohol, other drugs and crime. Key aspirations for communities across South East NSW relate to:

- retaining the rural character of settlements
- coping with population growth
- housing availability and affordability
- retaining and support young people
- ensuring the right services and infrastructure is in place to cater to cohorts such as older people (CRJO, 2021).

The region's population is projected to increase, with particular increases in places within commuting distance of Canberra and Sydney, in strategic centres and along the coast (NSW Government, 2017).



OUR VALUES

Individuals and community

The Resilience Blueprint engagement program included community workshops, targeted discussions and an online survey involving all 11 LGAs. Thousands of participants from different walks of life contributed to the dialogue across different age groups, gender identification, sexual orientation, employment status and physical and mental abilities.



Feeling safe is a key value for individuals and communities. This extends to looking out for vulnerable neighbours with physical and mental disabilities, and ensuring multicultural approaches are inclusive of the entire community and their needs.

Self-sufficiency is valued. To aid this, information is needed, along with a plan. The community is not powerless in picking itself up from adversity.

Retention of biodiversity and ecosystem values, with a focus on supporting Indigenous practices to care for Country, is important. Valuing the ability to 'do our bit' is strong, which means figuring out how to be adaptive and being careful about what we can and cannot rely on at times.



First Nations

Resilience is inherent to Australia's First Nations people. Across 29 discussions with First Nations people, there is strong awareness the climate is changing and that Country is enduring significant impact from human impact. 'The plants, animals, water and fish tell us', Country provides these indicators for us all.



Cultural burning practices should be immediately embedded in the care of Country and be standard practice in Australia. This will require employment and training of First Nations people across a whole range of related areas. It is a necessity, not a trend.

First Nations People should have a greater place in decision-making processes.

Creating space for yarning and truth telling, where opportunities for discussions on preparation for climate-based events is encouraged.

Youth

Conversations with 43 youth participants across the region to inform the Resilience Blueprint highlights strong values associated with the protection of family, community, natural habitat, wildlife and ecosystems. Culture and places of cultural significance, health, income, renewable energy and infrastructure are also passionate topics.

Connection with Country, engaged communities, climate change and sustainability are key aspects of focus for the region's youth.

OUR PLACES

Our places and townships form the basis for our social, economic and service needs interactions. Major cities in the region are Goulburn, Queanbeyan and Wagga Wagga with regional centres including Bega, Yass, Cooma, Young and Batemans Bay. These centres are supported by many unique local centres and townships.

The combination of landscapes, economic productivity and human settlements create and attract different social, cultural, community and economic qualities. These elements and their interactions represent the concept of 'place' which forms a key part of how we identify ourselves and our sense of belonging.

The region's heritage builds on a long Indigenous history which continues today. Following European colonisation, the region's agricultural heritage provided the foundation for the emergence of vibrant townships and communities which remains its largest industry. The region's history is embodied by protected heritage buildings and Aboriginal cultural heritage sites, connecting today and tomorrow with the past.

The scale of the region is spanned by an extensive state and local road networks, rail, air and travelling stock route networks. Coastal areas of the region also accommodate fishing, tourist and freight ports and recreational marinas. The Port of Eden in Bega Valley and Bateman's Bay in Eurobodalla are key locations which support diverse marine industries.

Because of the scale of the area and distances between centres, a high level of car dependence exists. Access to shared and public transportation services remains challenging across rural areas. However, active travel is supported by rail trail networks, walking and cycling networks and mountain bike tracks. While facilities differ across communities, the region in general offers a variety of facilities with libraries, sports facilities, community halls, emergency services, medical facilities and services, and aquatic centres. These assets underpin the social fabric of the places we call home. They also serve important roles before, during and after emergency events.

The region's general proximity to Canberra and Sydney has cemented its attraction for those who can access flexible and remote working arrangements. Local employment opportunities within the region and the recruitment and retention of a skilled workforce is an ongoing and crucial challenge. Housing availability plays a key role, with periods of housing stress contributing to dynamic economic and social circumstances across parts of the region, with many remaining in economic and social recovery from previous disaster events and as a result of the COVID-19 global pandemic.

In 2021, the region's Gross Regional Product was \$14.81 billion, which was almost a 2 per cent increase following a decline in 2020 as a result of COVID-19 impacts (NIEIR, 2021). The region supports an estimated 110,311 local jobs and 29,698 local businesses with the predominate industries being:

- agriculture, forestry, and fishing (6,296 registered businesses)
- construction (5,898 registered businesses)
- professional, scientific and technical services (2,975 registered businesses)
- rental, hiring, and real estate services (2,306 registered businesses) (.id community 2022).

The region's broad nature-based tourism industries, which include snow sports, mountain biking, surfing and bushwalking, attract increasing numbers of domestic and international visitors. The region is also known for its renewable energy supply in terms of wind, solar, and hydropower which is fast growing the economic revenue for the region as part of the transition from coal production and mineral mining (NSW Government, 2017).

The South East and Tablelands Regional Plan 2036 predicts the Port of Eden and Canberra Airport will enhance access to national and international markets, while more diverse tourism opportunities in the Snowy Mountains will strengthen long-term economic resilience in the face of changing snow seasons into the future.

In terms of agriculture, the top contributors in the region include beef cattle, broadacre crops, horticulture, viticulture, cultivated turf, poultry, sheep, lamb, wool and dairy. Value-add agricultural opportunities from stone fruit supply and cheese production are gaining popularity amongst small-scale producers and consequently support commercial, tourism and recreational activities (NSW Government, 2017 and Department of Primary Industries (DPI), 2020).

Livestock grazing in the region occupies approximately 50 per cent of agricultural land (DPI, 2020). The region is also known for its cherry and seed potato production.

Major projects in the region include Snowy Hydro 2.0, Inland Rail, multiple wind farms, the Wagga Wagga and Snowy Mountains Special Activation Precincts and several water storage and security projects. Rebuilding following the 2019-20 Black Summer bushfires remains a particular focus across the region.

Major national telecommunications and electricity corridors and infrastructure traverse the region, connecting the east coast of Australia.

UNDERSTANDING RISK

How we navigate resilience requires us to first consider a range of contributing elements.

SHOCKS AND STRESSES

Resilience is ultimately put to the test through the impact of acute shocks and chronic stresses that communities may experience. Acute shocks are typically sudden onset events such as floods, bushfires, heatwaves, earthquakes and disease. Chronic stresses are factors that place pressure on communities on a daily, frequent or reoccurring basis such as drought, high unemployment, weed and pest outbreaks, ageing populations and housing availability (Resilient Cities Network, 2015).

Resilience can be considered as the ability of a community or system to continue to aspire to sustainable development goals, even when stresses and shocks occur.

Importantly, we must remain aware that chronic stresses can amplify the impact of events, and chronic stresses are apparent at all times across all communities to different extents. The more effort it takes for communities to deal day-in-day-out under stress, the less 'reserve capacity' we have when a shock occurs.

RISK EXPOSURE, VULNERABILITY AND TOLERABILITY

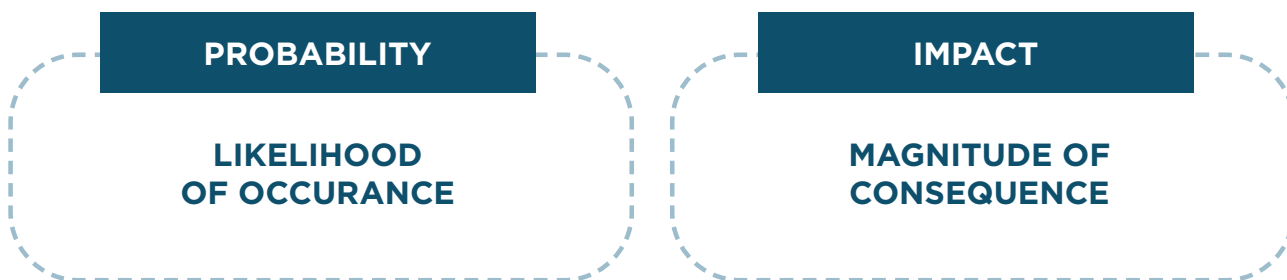
The concept of resilience, and the characteristics which define resilience, is tied to risk and vulnerability. However, it is important to keep in mind that risk and vulnerability assessment processes do not necessarily tell the entire tale about a community's level of resilience.

Understanding risk is a function of analysing the hazards that exist, the nature of what is exposed, and any vulnerabilities that multiply or amplify the potential impact of a hazard. Tolerability is a further consideration, which considers certain resilience measures employed to help people, systems, buildings and infrastructure assets and networks to withstand a certain level of hazard impact.

The Intergovernmental Panel on Climate Change (IPCC) (2020) defines risk as:

'the potential for adverse consequences for human or ecological systems, recognising the diversity of values and objectives associated with such systems'.

Identifying and understanding risks requires the consideration of the multiplying effects of:



In the 2018 publication 'Profiling Australia's Vulnerability', it is noted that:

'hazards only lead to disaster if they intersect with an exposed and vulnerable society and then the consequences exceed its capacity to cope. Vulnerability arises from the relationships that we have with the things we value (people, places, objects, critical services, emergency services, etc.) and how these things may be disrupted as a result of an emergency or crisis. Vulnerability also arises from the tensions and trade-offs we have to make about where to allocate limited time, effort and money in disaster preparation, response or risk reduction to protect those things of value' (National Resilience Taskforce, 2018).

Our tolerance to risk can vary and is dependent on many factors and circumstances. It is a function of the risk we are willing to tolerate or accept.

Risk is inherently a function of the consideration of:

- the probability or likelihood of a hazard occurring
- the elements (values and assets) exposed to the hazard
- aspects of vulnerability and sensitivity
- degree of consequence or impact.

Our capabilities to address risk and deploy risk management processes and approaches can help to avoid, mitigate or minimise risk probability, exposure, vulnerability or consequence.

A focus on resilience helps us to take a systems-based approach through everything we do to contemplate risk, extending beyond the parameters of emergency management to consider how we can make better informed decisions in anticipation of natural hazard events and other shocks and stresses on our communities.

“

With a changing climate we should protect the environment around us and the people in the community. For natural hazards, we should protect the animals and the people and the food so then we can survive.
Bega Valley Shire resident, 15 year old

”



OUR RISKS IN SOUTH EAST NSW

South East NSW is not a stranger to risks or disaster events. Over recent years we have endured one of the worst droughts in NSW recorded history which led into the 2019-20 Black Summer bushfires. Within months, the COVID-19 global pandemic not only caused widespread disruption but impacted and prolonged drought and bushfire recovery efforts.

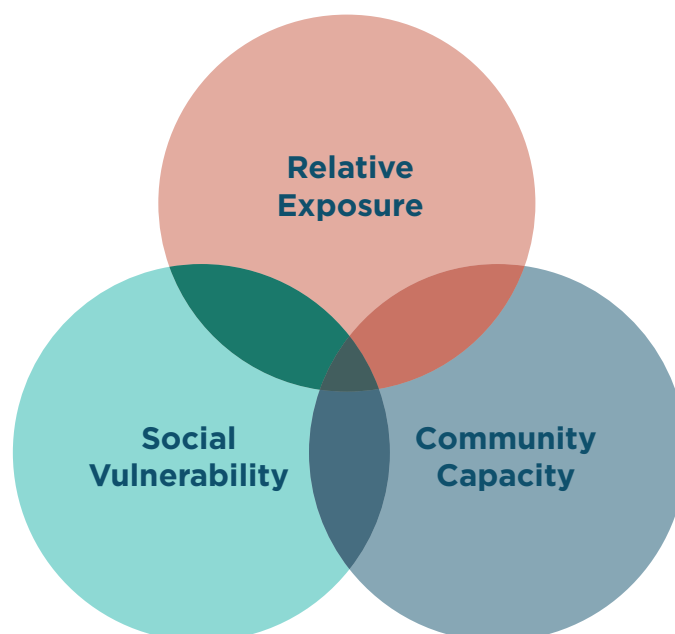
We have been at the epicentre of some of Australia's worst disasters. This includes the devastating 1997 Thredbo landslide, 2003 Canberra bushfires, 2018 Tathra bushfire and 2016 east coast low. In 1860, heavy rainfall in the Araluen and Braidwood area lead to severe flooding, claiming the lives of 24 people as one of the earliest records of major loss in the region.

The region is susceptible to bushfire, hailstorms and other severe storms, flooding, coastal hazards, drought, heatwaves and landslips. Extreme heat and heatwave is a particularly silent and invisible threat, one that is projected to rise across South East NSW between now and 2070 as a result of climate change.

How we continue to build resilience to risks and their cascading impacts requires us to understand and be aware of the risks that we face.



SOUTH EAST NSW RESILIENCE FRAMEWORK



Relative Exposure	Social Vulnerability	Community Capacity
Physical Exposure describes how much of the community is exposed to the hazard: • People & Buildings • Emergency facilities • Community facilities Physical Vulnerability captures the age and construction type of the buildings Catastrophe Modelling combines the frequency and magnitude of natural hazard events as well as the compounding effect of multiple perils.	Socio-economic and demographic factors which may exacerbate the effects of an external threat resulting in adverse impacts on a person's life, livelihood or assets. Community Disadvantage Community Health Mental health	Communities' capacities to resist, avoid, adapt to a disaster and to use their abilities for creating security, either before a disaster occurs or during its aftermath. Community connectdness Social protection and governance Knowledge and experience Self-protection Livelihoods

Figure 4 - Risk Frontiers resilience measurement framework for South East NSW

Resilience is generally regarded as a function of the intersection of relative exposure, social vulnerability and community capacity.

Relative exposure is a function of hazard, describing the frequency and magnitude of natural hazard events and capturing the compounding effect of multiple hazards (fire and flood for this analysis). Where a community is subject to both fire and flood, it is potentially less resilient than one exposed to a single hazard of the same frequency and magnitude.

The physical exposure of a community is determined such that the quantum of exposed people, buildings, essential facilities, industry, and agriculture can be evaluated. The physical vulnerability of exposed elements is also important, such as the age and construction type of buildings (for example, buildings with raised floors are more resilient to flood as they provide greater protection to the occupants and their belongings, resulting in less loss of life and property).

Social vulnerability is determined by examining socio-economic and demographic factors that may exacerbate or ameliorate the effects of an external threat to a person's life, livelihood, or assets. Examples of these types of indicators include age, occupation, health status, income and education.

Community capacity to resist, avoid and / or adapt to a disaster and to use these abilities to create security either before or after a disaster can be determined by examining several factors such as:

- the level of social wellbeing and community connectedness – often measured by the number of volunteers in a community and the availability of community facilities, knowledge, and experience of disasters (which improves community awareness and preparedness)
- self-protection – for example the availability of emergency services, structural protections or land management activities
- social protection and governance – including community organisations and diversity of employment in a community, which contributes to financial capacity.

Within each of the measurement framework indicators, an index has been produced by a weighted average of each metric contributing to the category. An analysis of the measurement framework indicators for each Statistical Area 1 (SA1) across South East NSW culminates as an integrated index of resilience, refer to the figure of community resilience indices.

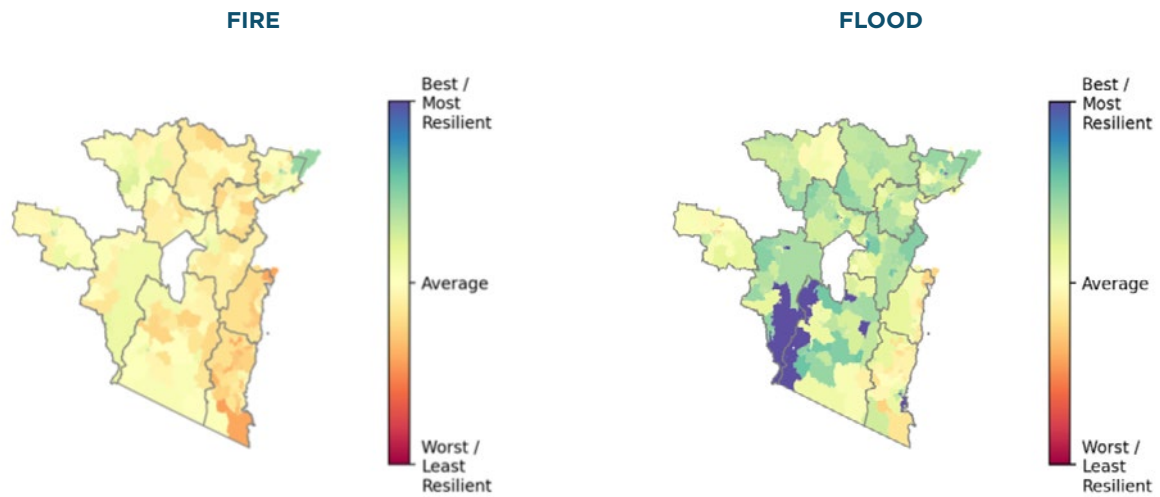


Figure 5 - Community resilience indices for Statistical Area Level 1 (SA1) across South East NSW



HAZARDS

A hazard is a natural process or occurrence, a source event which has the potential to result in harm or cause loss or damage depending on exposure. The United Nations Office for Disaster Risk Reduction (2020) provides a classification of hazard types to include:



Meteorological and hydrological - tropical cyclones, lows and troughs, drought, floods and heatwaves.



Extra-terrestrial - asteroid and meteorite impacts or solar flares.



Geohazards - earthquakes, volcanic eruptions, subsidence and landslides, tsunami, rockfalls and sinkholes.



Environmental - bushfires, land salination, reduced snow pack, biodiversity loss, contamination, storm surge and coastal erosion



Chemical - exposure of chemicals to humans, landscapes and ecosystems.



Biological - disease outbreak, epidemics and pandemics



Technological - technology failure and complex systems which can be interrupted across local, national and international scales across a spectrum of interests including economics, security, infrastructure, transport and health. This includes cyber attacks.



Societal - violence, conflict and civil unrest.

Hazards can occur at different frequencies and intensities, not all will generate the same impacts. It depends on the values that are exposed, whether they be people, buildings, infrastructure assets or environmental values or communities. A hazard occurrence on its own may not give rise to significant risk, rather it is the source of the potential for risk.

Whilst we are not immune to all of the hazards described above, the probability of some are extremely low in our region. But this does not mean that global impacts from events elsewhere cannot impact us. The 2022 eruption of Tonga's Hunga Tonga-Hunga Ha'apai volcano for example resulted in a tsunami warning for Australia's east coast, with effects felt in Bateman's Bay, particularly by the oyster industry, and along the NSW coastline.

Some hazards require hazard-specific management efforts and activities, whilst broader environmental, community and economic approaches enables a breadth and depth of baseline attributes that enable us to build resilience to a multitude of potential hazard shocks and stresses.

PROBABILITY

Weather and climate events can be acute, such as storm or flood, or chronic such as drought. Due to seasonal climate variability, hazard probability can vary from year to year. For example, during 2019-20 the climate was in an El Nino state and the primary hazards were related to drought, heat and bushfire. Whereas from 2020, the climate shifted to a La Nina phase, so the primary hazards were more related to storms and flooding.

There is also a geographical control on the primary hazard type, with inland locations being more exposed to heat and drought, while coastal locations are more exposed to storm and flood.

Based on current-day probabilities, the frequency of event conditions means the hazards most likely experienced in South East NSW include:



Severe storm



Bush & grass fire



Flooding



Heat



Coastal



Drought



Earthquake



Landslide



Biological

Local and district Emergency Management Plans also identify tsunami and snow-related hazards, including isolation and avalanche, and landslides as possible hazards within the region.

EXPOSURE AND VULNERABILITY

Exposure is related to the assets, facilities and elements of value in a location that are potentially subject to impact from a hazard. This includes people, buildings and infrastructure assets that are located within the floodplain, or within bushfire prone areas for example.

Vulnerability is a measure of the degree to which people and property are susceptible to a hazard or hazards, and their potential level of sensitivity to an impact. Some land uses for example are more vulnerable than others such as aged care facilities, child care centres and schools.

Data by LGA can be found in the Resilience Blueprint LGA snapshots.

Property and infrastructure

To measure exposure, Risk Frontiers' Natural Catastrophe loss models have been used to estimate the financial cost for four key hazards in the region being bushfire, flood, hailstorm and earthquake. Losses are evaluated for commercial, residential and industrial property. As such, this data does not represent a full risk-based assessment but enables a consistent view of potential exposure across key assets for each LGA in the region.

Across the region and in terms of Average Annual Loss (AAL) costs, flood and hail are the most significant natural hazards in terms of property, followed by bushfire. From an exposure perspective, there are approximately 257,527 property addresses (as per the Geocoded National Address File or G-NAF) in South East NSW. The exposure value of residential, Commercial and Industrial buildings, contents replacement and business interruption totals around \$132 billion.

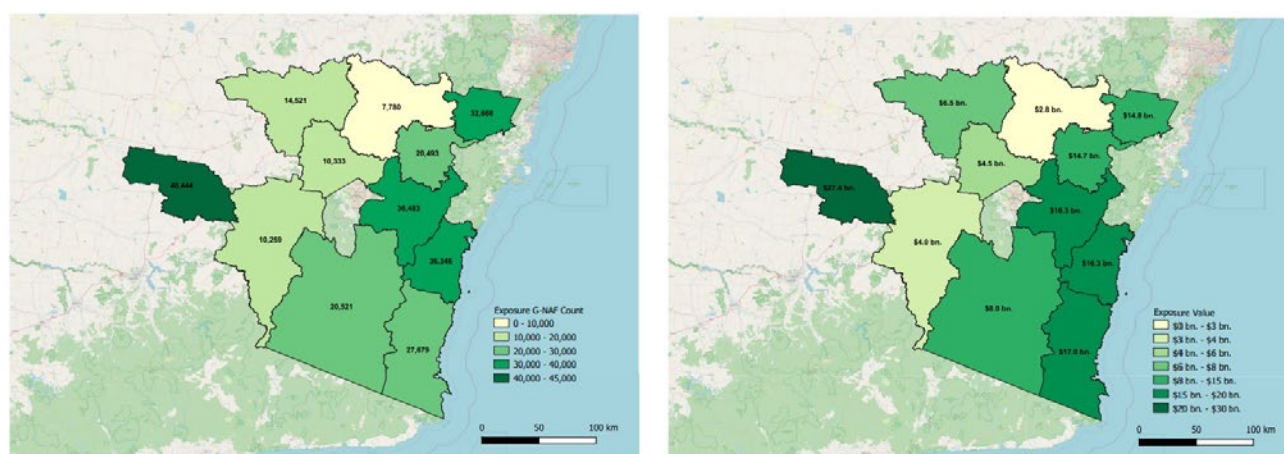


Figure 6 - Distribution of exposure across South East NSW with the G-NAF count on the left and aggregate exposure values (in billions) for each LGA on the right (Source: Risk Frontiers)

Most losses in South East NSW are likely driven by riverine flood, comprising around 59 per cent of the AAL metric. The main loss driver is not expected to drastically change within the time horizons of this study which are 2030 and 2070. The results show only slight increase in losses for 2030, with more important changes observed for 2070. The share of flood loss is projected to increase moderately but bushfire loss will increase considerably given that bushfire is the primary hazard widely expected to get worse with temperature increases, claiming more of the loss share.

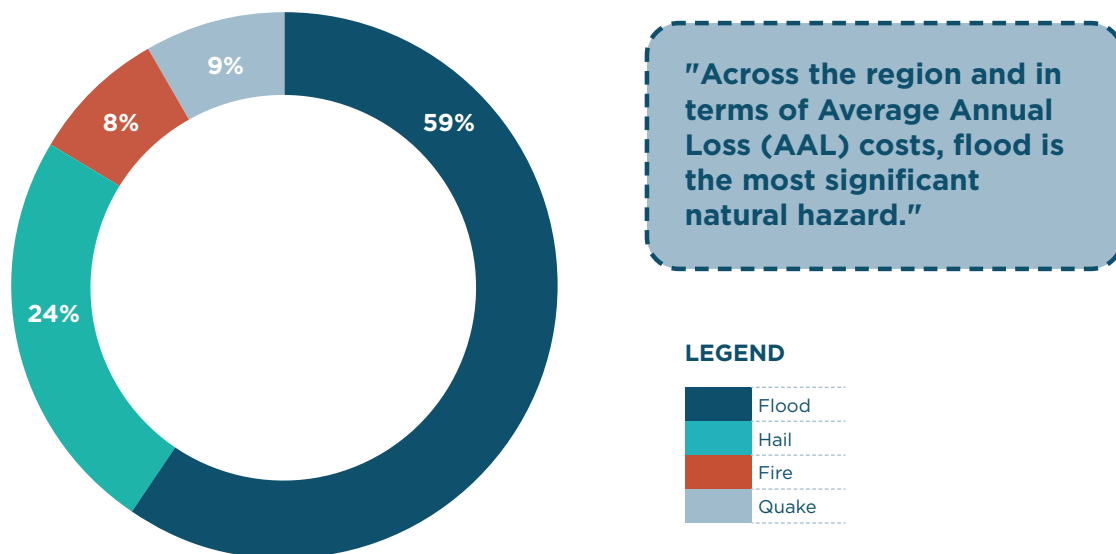


Figure 7 - Distribution of the Average Annual Loss (AAL) of infrastructure by hazard for South East NSW

It must be noted that the models used to estimate AAL are based on current climate change, population, land cover, land use and built environment data inputs. These inputs are dynamic and will change over time, influencing AAL projections moving forward. Asset replacement values will also increase over time. Quantification of exposure and vulnerability relies on data availability which is constrained in some cases. For example, bushfire attack level (BAL) rating for properties and age of asset could not be sourced as part of analysis of risk informing the Blueprint.

For each LGA in the South East, it is clear that bushfire risk will increase in the future in any of the greenhouse gas emissions scenarios that might occur.

Of the hazards examined, riverine flooding is the main loss driver for eight of the LGAs including Bega Valley, Eurobodalla, Goulburn Mulwaree, Queanbeyan-Palerang, Snowy Monaro, Upper Lachlan, Wagga Wagga and Yass. The main loss driver for Hilltops, Snowy Valleys, and Wingecarribee is hail.

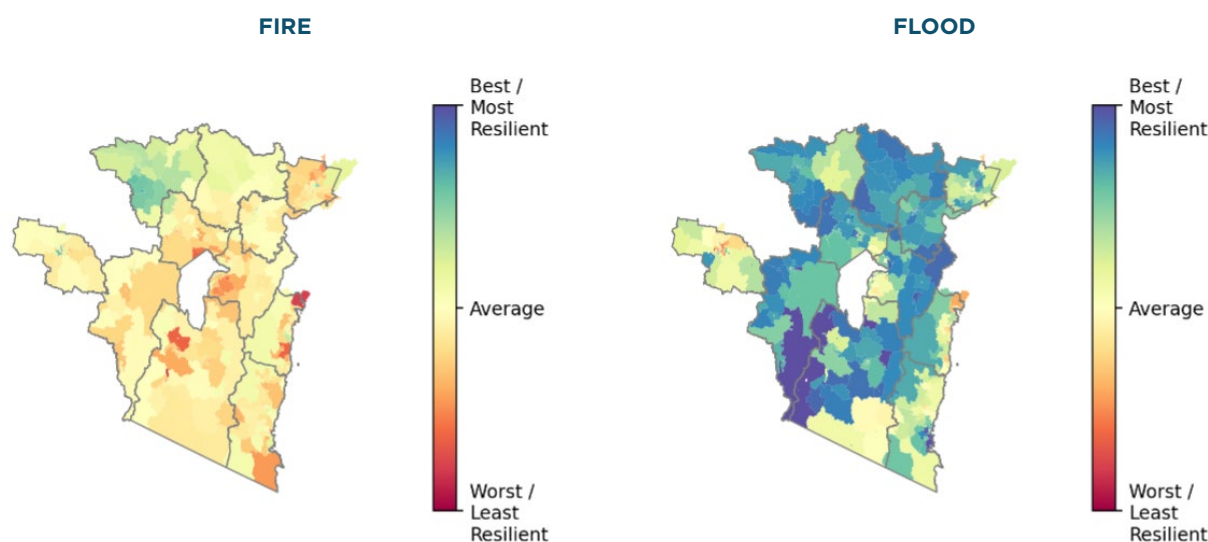


Figure 8 - Relative exposure indices for SAIs across South East NSW

Social and human health

The most difficult aspect of the reality of risk is that posed to life.

Across South East NSW, thousands of people live in locations that are exposure to one or more natural hazards including some in higher risk circumstances.

From a human health perspective, life loss throughout the region from 1900 to the present day has been analysed using PerilAUS, Risk Frontiers' database of natural hazard impacts.

Approximately 218 fatalities have occurred due to natural hazards throughout South East NSW from 1900 to June 2022. The natural hazards that have led to loss of life in South East NSW include avalanche, bushfire, flood, wind, hazardous surf, heatwave, landslide and lightning.

Floods have claimed the most lives in the region since 1900, accounting for 45 per cent of natural hazard fatalities, followed by bushfire at 23 per cent, lightning at 12 per cent and landslide at 9 per cent.

If we focus only on the past three decades since 1990 for a better understanding of the more recent hazards occurring across South East NSW, landslides account for the largest proportion of fatalities at 38.3 per cent, followed by bushfire at 25.5 per cent and flood at 21.3 per cent.

Since 1900, the eight most devastating natural hazard events in the region include the 1997 Thredbo landslide, followed by the 2019-20 Black Summer bushfires, the Burrinjuck Dam flood in 1950, the 1904-05 bushfires, the 1939 heatwave, bushfires in 1952, Goulburn flood in 1943 and the Black Friday bushfires of 1939.

The factors which contribute to fatalities and how this has changed over recent decades could be attributed to a number of things. From enhanced communications and early warnings systems, enhanced community participation in emergency management processes, changes in settlement patterns and housing quality, how we prepare for and respond to events is constantly evolving and improving.

Despite the above, many more lives have been lost as a result of the impacts of disaster events across the region in the days, weeks, months and years that follow. The physical and mental health toll of events is enormous. It also does not capture cascading health issues and fatalities. Data in these regards is difficult to bring together but does not change the reality of the pervasive impact of disasters.

From a biological hazard perspective, the COVID-19 global pandemic has brought into sharp focus the risk of disease, epidemics and pandemics and their associated impacts. These include risks to life and health, impacts on public health systems, mental health and the economy.

Social vulnerability is determined by examining socio-economic and demographic factors that may exacerbate or ameliorate the effects of an external threat to a person's life, livelihood, or assets. This includes indicators of age, occupation, health status, income and education. Community capacity considers the ability to resist, avoid and / or adapt to a disaster and to use these abilities to create security either before or after a disaster through considerations of wellbeing and connection, self-protection activities, social protection and governance.

An analysis of vulnerability and community capacity across South East NSW highlights where opportunities exist to direct particular strategies contained within the Resilience Blueprint directions framework.

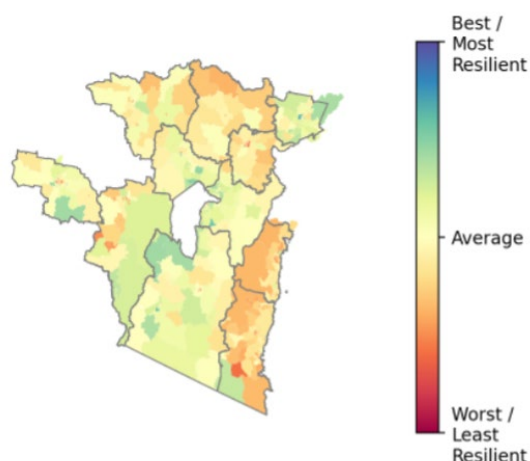


Figure 9 - Social vulnerability index for SA1s across South East NSW

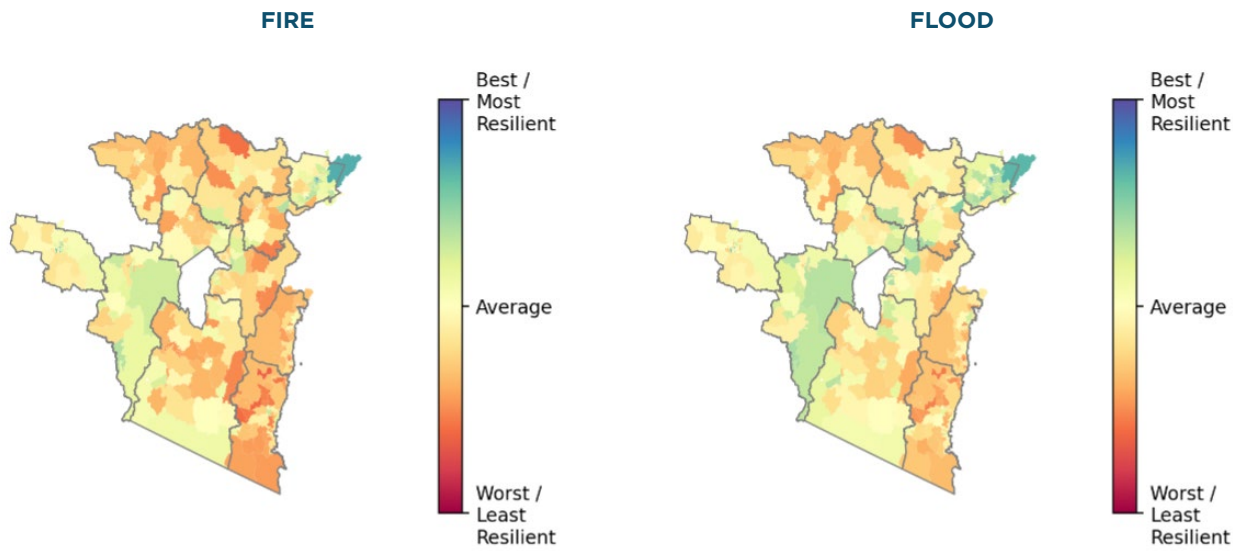


Figure 10 - Community capacity indices for SA1s across South East NSW



Natural environment

Exposure of environmental values has been explored, having regard to:



threatened ecological communities



land use



land cover



protected areas



connectivity



maximum above-ground biomass



fauna, flora and ecological communities



weed, pest and animal disease.

As part of this environmental risk analysis, hazard frequency indices combining current and future risk have been compiled for fire and flood.

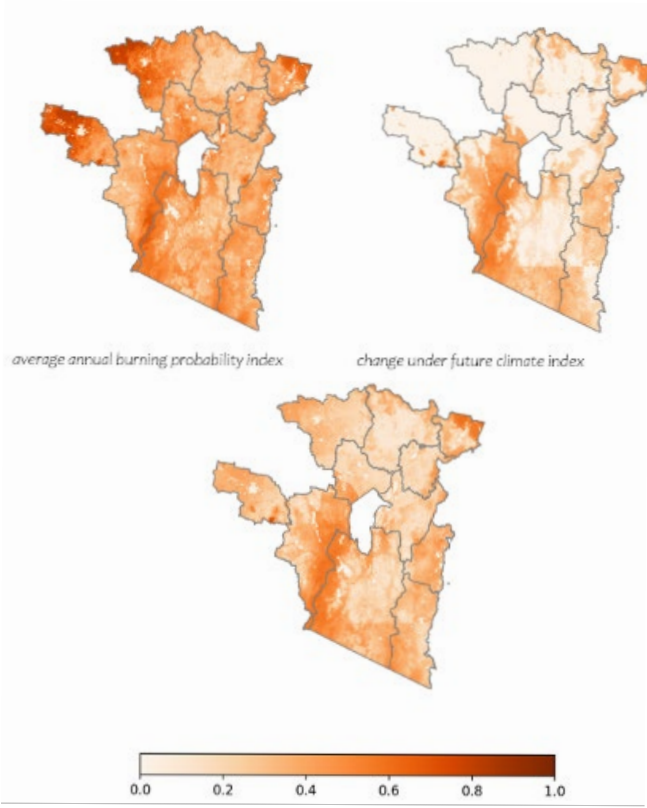


Figure 11 - Individual components of the fire hazard index (a and b) and final index c informing the Blueprint

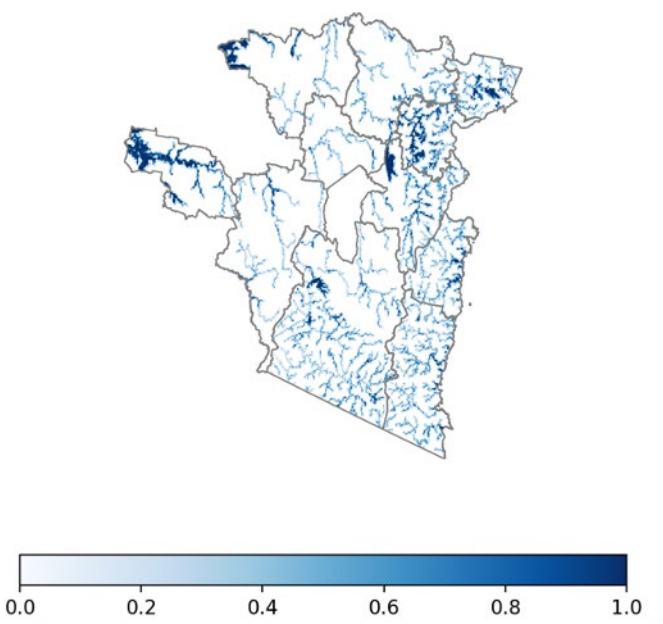


Figure 12 - Flood hazard index informing the Blueprint

The fire and flood indices are overlaid with an exposure index locating threatened flora, fauna and ecosystems along with agricultural lands.

Index	Weight
Fauna	1.6%
Flora	24.6%
Ecological communities	22.7%
Agricultural and farm land	33.4%
Max M	17.7%

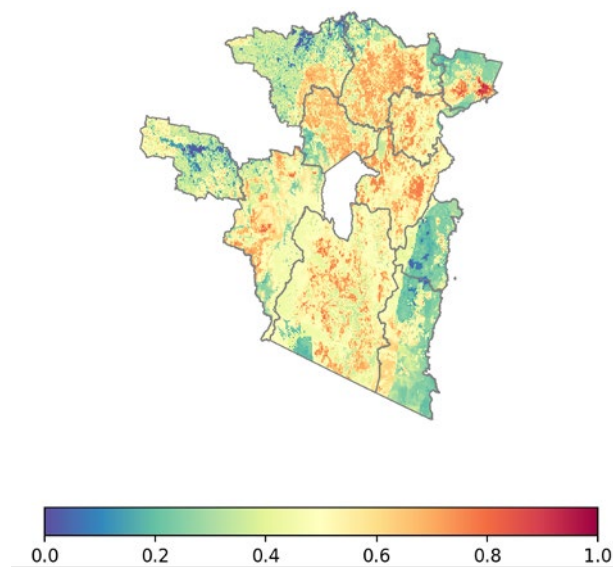


Figure 13 - Environmental values exposure index

The vulnerability and coping factors of natural environment systems are also considered, having regard to level of protection, connectivity and habitat quality, resulting in risk maps for fire and flood.

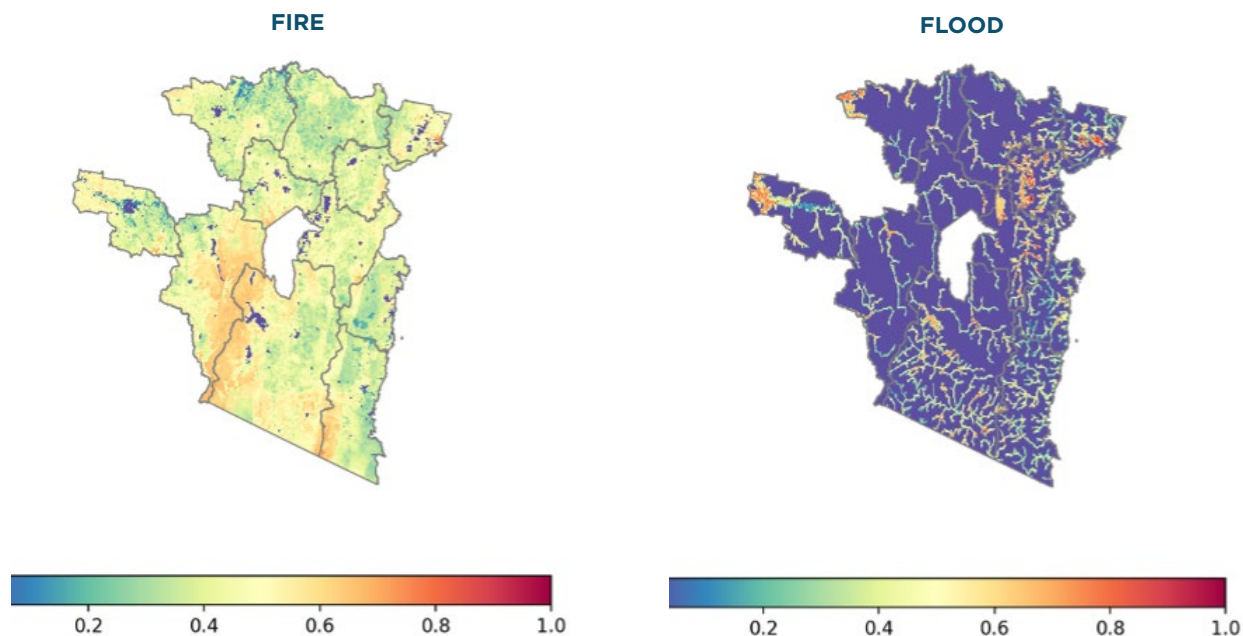


Figure 14 - Fire risk (left) and flood risk (rig) for natural environment values at the 1km2 resolution

The region is home to a vast number of vulnerable fauna and flora species. Areas of increased exposure and vulnerability include Goulburn Mulwaree, Queanbeyan-Palerang, Snowy Monaro, Snowy Valleys, Upper Lachlan and Yass, but all LGAs incorporate critical ecological values that are exposed and / or vulnerable. LGAs with high levels of sensitivity are those with endangered and critically endangered ecological communities.

From a fire risk perspective, the LGAs of priority are Snowy Monaro, Snowy Valleys, Queanbeyan-Palerang, Yass, Goulburn-Mulwaree and Wingecarribee. This is largely due to higher numbers of threatened species and for some LGAs, their location with regard to climatic zones.

From the flood risk perspective, Goulburn-Mulwaree followed by Wingecarribee are prominent LGAs in terms of exposure of natural environmental values.

Beyond these hazards, drought also has a significant impact on vegetation communities and system health. In the longer term, temperature increases and sea level rise may result in impacts on fruiting, flowering and marine and estuarine communities respectively. Further work in these areas is essential.

Stresses that contribute to vulnerability

Stresses, or sensitivities, are not hazards but are circumstances that can change or even amplify how a hazard or shock event impacts our community, economy or the environment.

Aside from climate-driven events and disasters, other long-term, insidious aspects of climate change include sea level rise, and more frequent and prolonged periods of drought.



Socio-economic stresses include ageing populations, housing availability and affordability, rising homelessness, displaced workers, over-reliance on a single industry or small number of industries for employment or income. The loss of and damage to dwellings across the region following the Black Summer bushfires has amplified the effects of housing shortages in the region. Other issues include impacts on uninsured, underinsured and unapproved dwellings.



Environmental stresses might involve issues of water quality or availability, weed and pest outbreak or loss of biodiversity and environmental degradation.

Built environment and infrastructure stresses can include ageing infrastructure, increasing pressure on infrastructure networks, land use conflicts and limited physical and digital connectivity.

Stresses, in their multiple forms, can influence how and the degree to which hazard events are felt across different parts of communities as well as economic, built and natural environmental systems. Stress factors can be profound in the absence of a hazard or disaster event.

Stress on systems can limit our capacity to cope or adapt to different circumstances. What makes stress more difficult to identify is the inability to measure some attributes at the local scale, requiring proxy indicators to examine potential impact.

Over time, stresses will change across the region as a result of social, economic and environmental cycles. Current stresses identified by communities as part of the Resilience Blueprint engagement processes include:



increasing housing stress and homelessness



inflation



inability to attract skilled workforces



population fluctuations in response to trends



increasing mental health challenges and limited access to support services



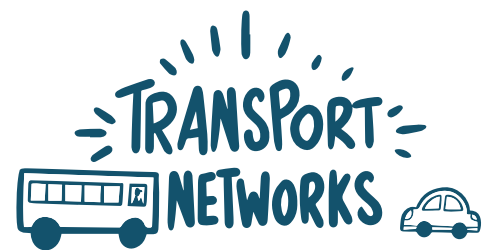
limited access to public transport, education and health services



declining water quality of natural watercourses, and water shortages



limited telecommunications and digital connectivity across large areas of the region.



RISKS IN A CHANGING CLIMATE

Across South East NSW, our climate is changing and this is impacting the frequency and intensity of hazards, and the interaction of climatic and weather factors with the landscape.

Climate modelling helps us to examine the implications for hazard likelihood, and gain a clearer understanding of potential future scenarios of exposure, vulnerability and potential impact. This enables us to plan for and work to mitigate and adapt to these potential consequences before they occur, making us more resilient into the future.

Climate modelling performed by Risk Frontiers as part of the formulation of this Resilience Blueprint has focussed on the specific climate projections for each LGA within South East NSW and for the region as a whole. This provides a clear view of the future climate context where we live and work.

Different emissions scenarios are considered as part of climate modelling, including, low, medium and high emissions scenarios. These scenarios are reflected by Representative Concentration Pathways (RCPs). RCP4.5 reflects the 'medium' emissions scenario

According to IPCC reporting, global surface temperature will continue to increase until at least the mid-century under all emissions scenarios considered. Global warming of 1.5°C and 2°C will be exceeded during the 21st century unless deep reductions in CO₂ and other greenhouse gas emissions occur in the coming decades. It is virtually certain that increasing temperatures and energy within the climate system will result in wide-spread changes to weather and climate patterns.

Under the RPC4.5 scenario, which is the 'medium' rather than the worst case emissions scenario, by 2070 the South East region of NSW will see:



50% INCREASE

in drought index average compared with 2010



Hottest day temperatures rising from 37° Celsius to 39° Celsius



72% INCREASE

in hot days from 8.1 in 2010 to 14 days



44% INCREASE

in the Forest Fire Danger Index (FFDI) 25 and over from 16 in 2010 to 23 days



29% INCREASE

in storm days from 1.3 in 2010 to 1.7 days



16% DECREASE

in very heavy precipitation days from 3.9 in 2010 to 3.3 days



6% DECREASE

in total annual rainfall from 744mm in 2010 to 697mm



13% DECREASE

in frost nights from 38 in 2010 to 33 nights

Overall, the region is expected to become drier and hotter, with increased incidence of drought. In alpine areas, reduced snow quality and length of season is also projected.

Hazards like bushfire and heatwave will become more frequent and intense under these conditions. When it rains, it may be concentrated, leading to flash flooding.

Cascading impacts will relate to water security and availability, the impacts of extreme heat on people, the natural environment, built environment and infrastructure. Storm damage, already a major cause of property damage and economic loss in NSW, will

increase.

The magnitude of change varies across the region.

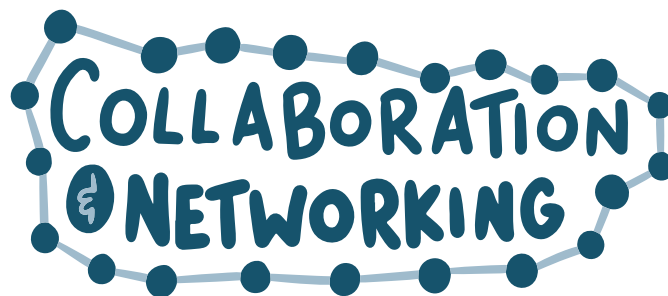
Further detailed consideration of current and future hazards and their risk dimensions follows, with additional information contained in the LGA-specific snapshots in the Blueprint Appendix.

ENABLING ADAPTATION IN THE SOUTH EAST (EASE)

To help the South East and Tablelands region adapt to the impacts of climate change, more than 150 state and local government stakeholders were brought together in 2014 as part of the NSW Government's Enabling Regional Adaptation work. Participants collaboratively identified how different economic, socio-cultural and environmental aspects (also known as systems) in the region are vulnerable to climate change. For each of these systems, the vision for a climate-resilient future was identified, and opportunities for action were co-designed.

Enabling Adaptation in the South East (EASE) report, published in November 2017, aims to use tacit local knowledge to identify regional climate vulnerabilities and develop workable and agreed pathways and projects that minimise the impacts of climate change on local communities and build resilience to future extreme events and hazards.

Identified were aspects of existing (business-as-usual) regional systems which are resilient to climate change, and those which will need transition pathways to reach an ultimately transformed system in the future.



REGIONAL HAZARD AND RISK PROFILE

The consideration of hazard exposure and vulnerability allows for the understanding of our potential risks, from which we can consider our capability and capacity to cope and adapt. The following sections step through key hazard-related risks relevant to South East NSW.

Snapshot overview

A snapshot of risk characteristics by hazard for South East NSW.



Severe storms, wind and hail

- the most frequent event type across the region
- difficult to predict and with potentially high cost impacts
- risk is widespread but particularly pronounced for coastal LGAs east of the main range



Bush and grass fire

- generates significant damage to and loss of infrastructure, and loss of life
- major impacts on ecosystems
- climate change is driving increased frequencies and intensity of bush fire events



Extreme rainfall and flooding

- generates the greatest damage to infrastructure, highest fatalities and highest costs
- flash flood and riverine flood risks are elevated for higher density population centres
- climate change likely to influence flood heights into the future



Heatwave

- generates the greatest damage to infrastructure, highest fatalities and highest costs
- flash flood and riverine flood risks are elevated for higher density population centres
- climate change likely to influence flood heights into the future



Coastal hazards

- Sea level rise, storm tide and storm surge relevant to coastal LGAs, with increased risk as a result of climate change
- Tsunami risk exposure is elevated for some parts of the coastline
- Exposure of infrastructure and assets is a key area of focus



Drought

- chronic and widespread in nature, though local relief can occur at times
- relationships between drought, mental health and wellbeing, community economic performance and environmental health
- the region is projected to become hotter and drier as a result of climate change, but impact is not uniform across all LGAs



Earthquake

- rare in probability but high in consequence
- the region is a higher activity hot spot for geological activity than other parts of Australia, with a long history of tremors



Landslide

- rare in probability but potentially high in consequence depending on location
- risk is elevated for LGAs with steep topography



Biological

- some rare events and other relatively common, of varying consequence
- implications for public health and economic productivity.



Severe storm, wind and hail

Storms are the most frequent hazard event experienced across the region, but only sometimes does damage occur as a result. When damage does occur, it tends to be substantial but over relatively localised areas.

Storms can produce heavy rainfall which leads to localised and flash flooding, gusting winds can damage buildings and hail can lead to costly property and crop damage or loss. Hail can also cause injury to humans and wildlife. They can also result in tremendous insurance costs which can have longer-term implications for policy holders.

Under present day climate, LGAs in the region are exposed to several types of storms, including east coast lows, extra-tropical lows, fronts, snowstorms, thunderstorms, and hailstorms. Some of the most severe impacts such as heavy rainfall, strong winds, and large waves and elevated ocean levels are associated with east coast lows. There is large year-to-year variability in storm activity, which is modulated by Indo-Pacific climate drivers. Storms tend to be more frequent during La Niña and Indian Ocean Dipole (IOD) negative periods and less frequent during El Niño IOD positive. This relationship is not expected to change under a warming climate.

East coast lows are one of the most damaging storm types to impact South East NSW and have most impact on near-coast LGAs including Eurobodalla, Bega Valley, Wingecarribee and Goulburn Mulwaree. However, many east coast low events transition over the mainland as cut-off lows where they can bring damaging winds and snowfall to low elevations affecting most LGAs in the region. East coast low frequency is expected to increase slightly under future climate projections, consistent with an expectation of increased large-scale interactions between warm and cool air masses as the climate warms.

Extra-tropical lows and associated fronts and thunderstorms can cause significant risk, especially during summer when they are a primary cause of dangerous bushfire ignition. Across the region, damaging winds are typically associated with the passage of extra-tropical storms and fronts. Windspeeds are strongest in the north-western LGAs including Wagga Wagga, Hilltops and Upper Lauchlan. It is noted that values are averages across each LGA, and windspeeds and individual locations, such as the Kosciuszko area, can be significantly higher than the LGA average.

Maximum annual windspeed is projected to increase across all LGAs in both near and mid-term projections, suggesting an increase in the strength of frontal systems, consistent with a projected increase in large-scale latitudinal temperature gradients as the climate system warms.

Some of the main issues and challenges associated with storms include beach erosion, disruptions to power and water supplies, disruption and damage to roads through treefall, downed power lines, landslips, washouts, and erosion. Cascading impacts can relate to more frequent emergency operations, greater demand on waste management, damage on council assets and resource and additional impacts associated with strong winds, extreme rainfall and flooding.

Potential for increased periods of storm activity combined with projected sea level rise will place additional stresses on coastal development and infrastructure. Storms such as east coast lows are also one of the main contributors to rainfall, and so can be beneficial in terms of recharging water supplies.

Snowstorm impacts are typically restricted to the higher elevation areas of Snowy Monaro and Snow Valleys, but occasionally (approximately 1-2 times per year) snow to low elevations can cause widespread disruptions to roads and traffic across many other LGAs.

Dust storms in the western parts of the region around Wagga Wagga come with their own unique impacts, not least of which includes the potential for respiratory distress and difficulties breathing in some cases.

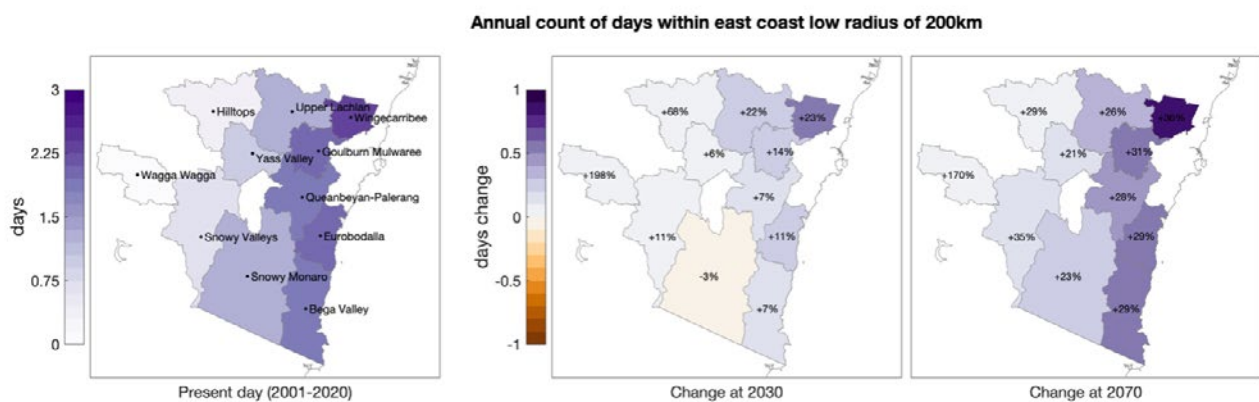


Figure 15 - Frequency of east coast low days. Values are 20-year averages centred on the displayed year, such that 2030 is the mean of 2021 to 2040. Projections are the ensemble mean 20-year averages from a 2-3 degree warming scenario (RCP4.5)

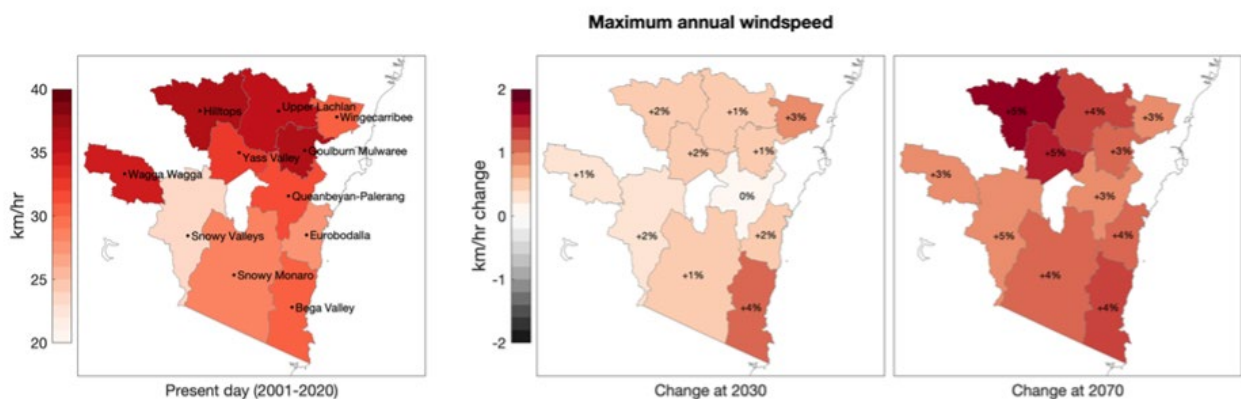


Figure 16 - Annual maximum windspeed (km/hr). Values are 20-year averages centred on the displayed year, such that 2030 is the mean of 2021 to 2040. Projections are the ensemble mean 20-year averages from a 2-3 degree warming scenario (RCP4.5)



Bush and grass fire

Bushfires and grassfires are a common hazard across the region, and the impacts over the years have been life-changing for many.

From the 2003 Canberra bushfires, one of the first instances of urban infiltration of bushfire in Australia, to the 2018 Tathra bushfire and the devastating 2019-20 Black Summer bushfires, the region has seen more than its share of damage, and loss.

Large expanses of the region comprise national parks, state forests, reserves and private bushland holdings. These areas, their ecosystems and biodiversity and the habitat they provide is of high value. It also a key attribute in our lifestyle decisions around where we live and how we recreate, and is a large part of how we self-identify.

Whilst records of emergency and disaster events has changed over time, and less events were characteristically captured in the early parts of the 1900's, major fire events were recorded in Cooma and Delegate in 1904, across the region in 1939, in 1952 in Erina, the 1965 Tarlo / Chatsbury / Bungonia bushfires, the 2003 McIntyre's Hut bushfire, 2017 Carwoola bushfire, and more.

Grassfires are also a common part of life on the land, with graziers and farmers equipped with farm units to quickly respond to fast-moving grassfires. Loss of valuable fodder, sheds and equipment is a key risk, hence the level of capability to deal with fire that exists across agricultural communities.

However in some conditions, decisions around the need to leave early need to be made.

Drought and extreme heat are priming factors that can be associated with major bushfire events in Australia. Across the South East region, climate projections for annual hot days, drought index averages and fire danger days will increase between now and 2070, meaning overall, the region is becoming more prone to fire conditions. The magnitude of bushfire weather extremes (daily maximum FFDI) will increase across all LGAs. The largest changes for bushfire weather across southeast Australia are expected to be occurring during the spring, with a projected earlier onset of the bushfire season under a warmer climate.



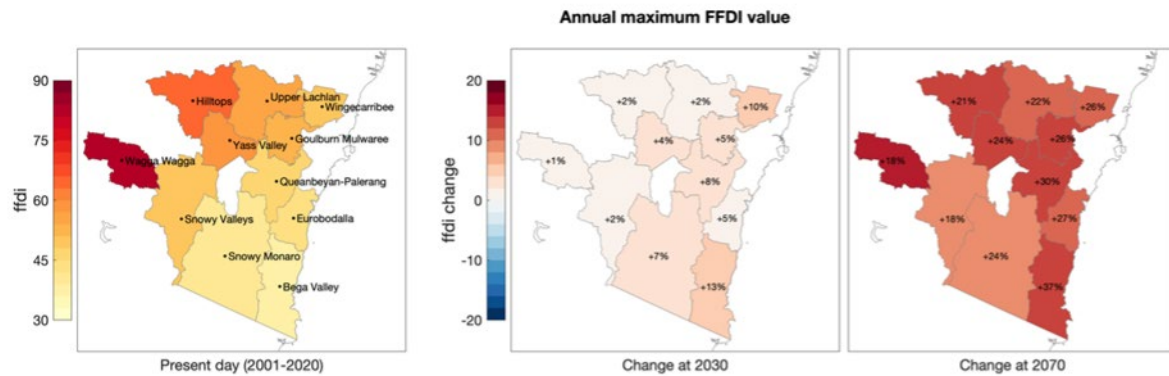


Figure 17 - Magnitude of bushfire weather severity as represented by the annual maximum FFDI. Values are 20-year averages centred on the displayed year, such that 2030 is the mean of 2021 to 2040. Projections are the ensemble mean 20-year averages from a 2-3 degree warming scenario (RCP4.5)

To adapt to this, we have to make decisions, develop plans and implement measures to mitigate our risk and our growing exposure.

We can do this through combined approaches that include risk-based land use planning, building provisions, natural areas management, cultural burning practices and caring for country more broadly, weed management, enhanced emergency awareness, property preparation and maintenance and household survival planning.

The 2020 Royal Commission and 2020 NSW Bushfire Inquiry both explored the benefits of ecological burning and putting good fire onto the landscape. Cultural burning practices were deployed across Australia prior to European colonisation, with a focus on maintaining healthy Country. Reading cues from Country to know when and where to burn, trickling fire across the landscape to regenerate food sources for wildlife and keeping undergrowth down, ultimately reducing the risk of large-scale and hot-burning bushfires.

Discussions with 29 First Nations people to inform the Resilience Blueprint affirms the need to embed care for Country as standard practice across Australia. This needs to be delivered through training of First Nations people and giving First Nations people a greater place in decision-making in land management activities, and beyond.



Extreme rainfall and flooding

Flooding is one of the costliest hazards in South East NSW, largely owing to its impact to essential infrastructure assets which can damage large stretches of roads, bridges, buildings, homes and cause significant agricultural losses.

Rainfall however is an important and valuable necessity for the landscape, community and economy. It replenishes terrestrial water storages, keeps water flowing through catchments and balances bushfire threat by moistening soils and vegetation.

Across the region, more than 147 flood studies have been prepared by local governments and other agencies to explore catchment-scale and localised flood risks. These studies help inform land use planning processes, infrastructure design and asset management activities, emergency management and environmental rehabilitation and protection measures.

Several types of floods can be experienced across the region, including riverine flooding where floodwaters inundate expansive floodplains, often yielding fertile soils so it is not surprising that agricultural activities are highly exposed.

Also present is localised flooding and flash flooding, where heavy rainfall over short periods of time lead to rapid inundation. This type of flooding can be fast-flowing, as runoff makes it way to local creeks and tributaries. Flash flooding can catch people off guard leading to dangerous situations, particularly for road users.

The region forms the headwaters of the Snowy, Murray, Murrumbidgee and Lachlan rivers, major waterway systems that form part of the Murray Darling Basin. Towards the coast, short-run coastal catchments are highly responsive to rainfall, and waterways can rise quickly with overland flow also creating localised flooding.

Major historical floods across the region include too many to name but include a cluster of events between 2020 and 2022 during a strong La Nina period, as a result of low pressure systems and complex slow-moving weather systems, several of which broke rainfall records.

The 2011 Bega and Moruya flood event and 2012 Murrumbidgee flood also occurred during a strong La Nina period which saw widespread flooding across eastern Australia. Over the years, both Bega and Moruya have experienced numerous flood events in 1925, 1945, 1961, 1971, 1992 and 1997.

Wagga Wagga, Yass, Queanbeyan, Goulburn and Cooma also carry long histories of flood-related events, some more damaging than others. Over time, some towns have constructed levees for flood protection up to certain flood levels, along with other mitigation efforts.

Frequency of very heavy rain days (over 30 millimetres) and maximum 1-day rainfall are indicative the frequency and intensity of rainfall extremes which can lead to a range of hazards including flooding, landslides, and damage to infrastructure including roads.

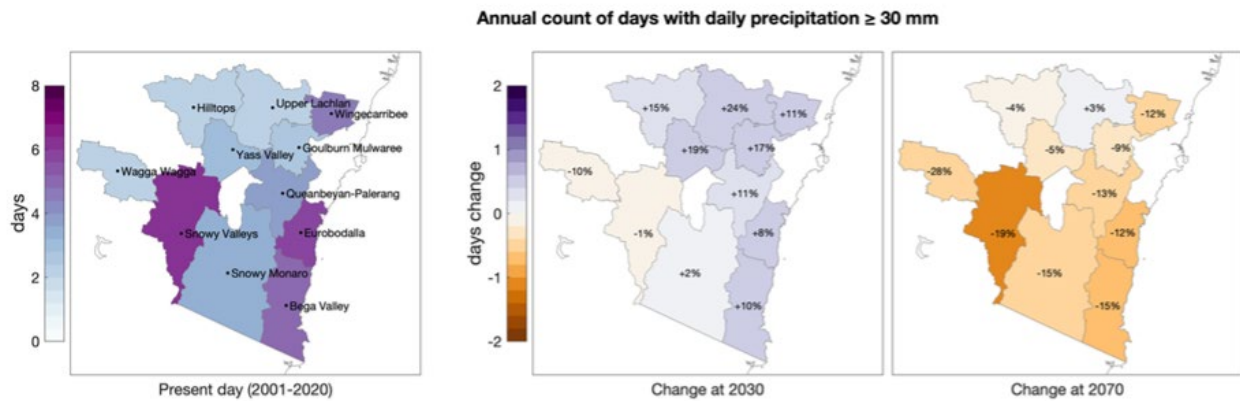


Figure 18 - Frequency of very heavy rainfall days. Values are 20-year averages centred on the displayed year, such that 2030 is the mean of 2021 to 2040. Projections are the ensemble mean 20-year averages from a 2-3 degree warming scenario (RCP4.5)

Under present day climate there are on average four very heavy rainfall days per year with highest frequency in Snowy Valleys and the coastal LGAs of Bega Valley, Eurobodalla and Wingecarribee. Maximum 1-day rainfall totals are highest at the coastal LGAs and are likely to be associated with east coast lows.

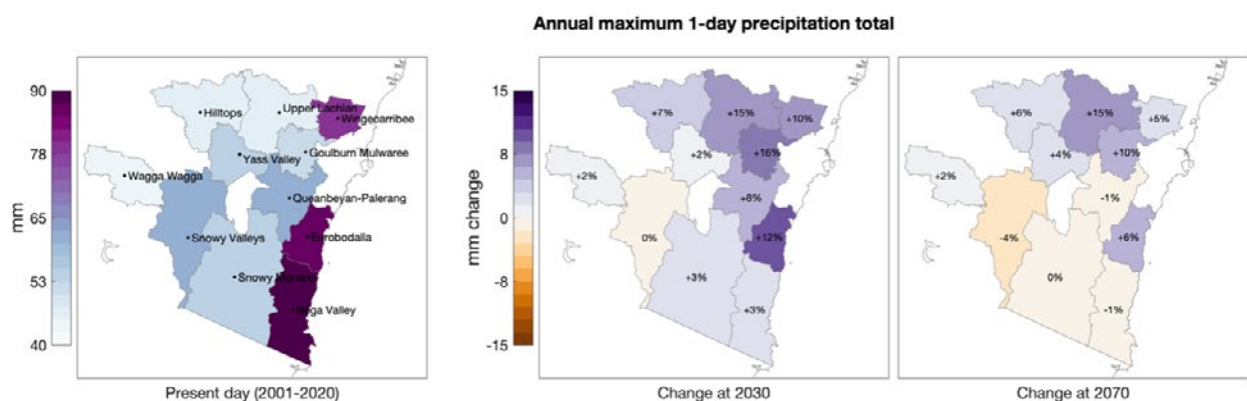


Figure 19 - Annual maximum 1-day rainfall total (millimetres). Values are 20-year averages centred on the displayed year, such that 2030 is the mean of 2021 to 2040. Projections are the ensemble mean 20-year averages from a 2-3 degree warming scenario (RCP4.5)

During the 21st century, the primary driver of year-to-year variability in rainfall will continue to be the tropical climate drivers of IOD, El Niño-Southern Oscillation (ENSO) and the interdecadal Pacific Oscillation (IPO). Projections for Pacific climate are indicating an increase in ENSO amplitude, meaning both El Niño and La Niña events will be stronger. Extreme rainfall events will produce higher rainfall totals due to the physical relationship between a warmer temperatures and higher atmospheric moisture capacity. Higher rainfall totals may lead to higher flood levels during flooding events, but the frequency of these events will not differ significantly from present. Whilst frequency may not differ, flood risk due to extreme rainfall events shows an increase due to a warmer atmosphere.



Heatwave

Extreme heat and heatwave is Australia's leading cause of natural hazard life loss (Bureau of Meteorology (BoM), 2022). Heatwaves can be dangerous because they pose health risks to the most vulnerable, such as elderly people and very young children. Heatwaves can also affect the transport, agriculture and energy sectors and associated infrastructure (BoM, 2022).

A heatwave occurs when the maximum and the minimum temperatures are unusually hot over a three-day period at a location. This is considered in relation to the local climate and past weather at the location (BoM, 2022).

It takes more than just a high daily maximum temperature to define a heatwave. It is also about how much it cools down overnight. Hot days without hot nights allow some recovery from each day's heat, but if the temperature stays high overnight, the maximum will be reached earlier the following day and will last longer. When unusually high night and daytime temperatures persist, heat stress becomes a critical factor in human health and whether infrastructure can function properly, and the likelihood of infrastructure or network failures as energy demand peaks (BoM, 2022).

Drought and heat were key preconditioning factors leading into the 2019-20 Black Summer bushfires, and this is a consistent phenomenon associated with most if not all major bushfire events in Australia. This also means that our adaptive capacity is drawn-down by dealing with these factors in advance which may mean we do not have enough physical, mental or emotional energy left in reserve to deal with cumulative events and impacts.

Across South East NSW, temperatures are increasing as a result of climate change (AdaptNSW, 2022). The CRJO region currently experiences an average of 8 days per year with temperature over 35 degrees Celsius, and the hottest daily temperature is on average 37degrees Celsius. By 2070 under RCP4.5 there is expected to be on average 14 days per year with temperature over 35 degrees Celsius, and the hottest daily temperature will be on average 39 degrees Celsius. Inland LGAs, especially Hilltops and Wagga Wagga, are more exposed to temperature extremes compared to more coastal LGAs.

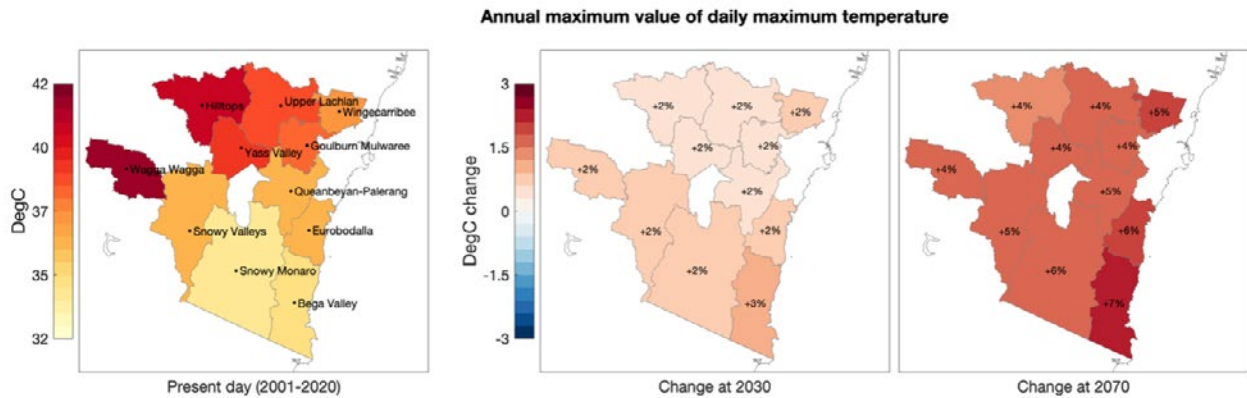


Figure 20 - Frequency of days per year with temperature exceeding 35 degrees Celsius. Values are 20-year averages centred on the displayed year, such that 2030 is the mean of 2021 to 2040. Projections are the ensemble mean 20-year averages from a 2-3 degree warming scenario (RCP4.5)

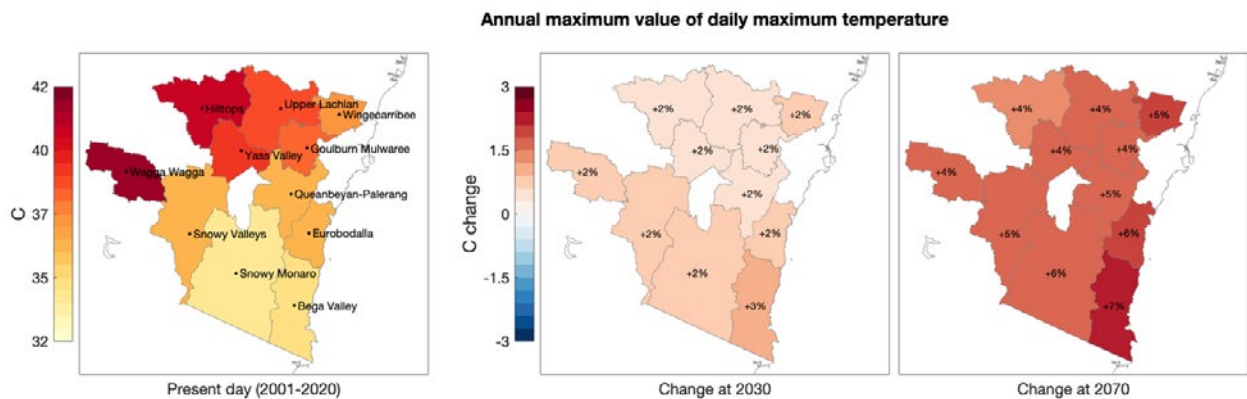


Figure 21 - Maximum temperature of the hottest day in degrees Celsius. Values are 20-year averages centred on the displayed year, such that 2030 is the mean of 2021 to 2040. Projections are the ensemble mean 20-year averages from a 2-3 degree warming scenario (RCP4.5)

Under future climate the frequency of hot days will increase most for the inland LGAs, whereas the magnitude of temperature extremes will increase most for the coastal LGAs of Bega Valley, Eurobodalla and Wingecarribee. Other extreme heat measures such as consecutive hot days and Excess Heat Factor (EHF) are not shown but were investigated and indicate similar increases under a warming climate.

The largest increases in heatwave and high temperature extremes will be seen during the summer months when it is already warmest. However high temperature extremes will also occur more frequently during spring and autumn.

With regard to the inverse and looking at frost nights, it is highest for inland and high elevation LGAs, such as Snowy Monaro. Little change is expected in the short term however, by 2070 there will be clear decreases in the frequency of frost nights across all LGAs, especially Snowy Monaro, Snowy Valleys, and Queanbeyan-Palerang.

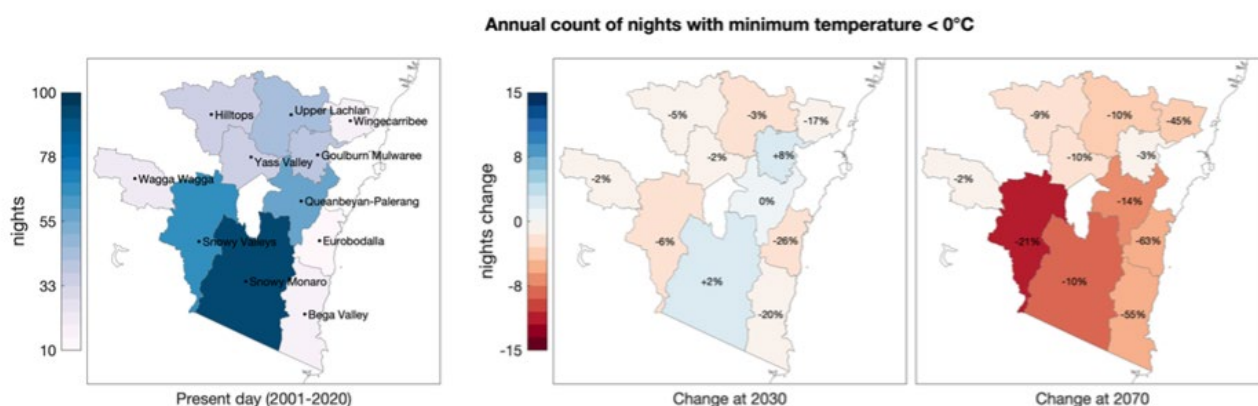


Figure 22 - Frequency of nights per year with temperature <0 degrees Celsius. Values are 20-year averages centred on the displayed year, such that 2030 is the mean of 2021 to 2040. Projections are the ensemble mean 20-year averages from a 2-3 degree warming scenario (RCP4.5)

Projections for increases in hot days and heatwave days will create a range of issues and adaptation challenges for all LGAs, including increased maintenance costs for roads and public spaces, increased municipal water demands coupled with increased pathogen risk, serious disruptions to council productivity through work health and safety issues, energy usage, demands on emergency services and increased visitation to the coastal zones. The threat to human health from extreme temperature events will increase the need for adaptation measures to be included in planning and other decision-making.

The biophysical impacts of increased temperature will place additional stresses on ecosystem health in council-managed parks and reserves. Increasing temperatures also contribute to increasing risk from bushfire weather and drought.



Coastal hazards and risks

Two LGAs in the region are located on the coastline, including Eurobodalla and Bega Valley.

Our coastlines are dynamic and subject to constant change as a result of coastal processes and coastal hazards.

Coastal processes include elevated water levels, waves and currents both of which vary with tides, storms and the construction of structural protections (Eurobodalla Shire Council, 2017 and Bega Valley Shire Council, 2015).

Coastal hazards are complex hazards, driven by meteorological, hydrological, environmental and geological activities, including a combination thereof. For the most part they are commonly storm-related, where storm surge and storm tide cause coastal erosion as was the case during the 2016 east coast low event.

Coastal hazards can involve beach and dune erosion, shoreline recession, sand drift, coastal inundation, slope and cliff instability, unstable entrances and erosion and inundation of estuary foreshores from tides, waves and floodwaters (Eurobodalla Shire Council, 2017 and Bega Valley Shire Council, 2015).

Both Eurobodalla Shire and Bega Valley Councils have undertaken comprehensive coastal hazard and risk management plans to effectively plan for these hazards and their associated risks, including as a result of climate change.

Global mean sea level has risen faster since 1900 than over any preceding century in the past 3,000 years (IPCC, 2022). Around the Australian coastline, sea levels are currently rising at a rate of ~3.7 millimetre per year. Global sea levels are projected to continue rising throughout and beyond the 21st century under all scenarios. Projections are for up to 1m sea level rise by 2100 under RCP8.5 however, uncertainty about ice sheet response means this could be a significant underestimation. For context, global sea levels have risen over 120 metres since the peak of the last ice age, therefore a rise of more than 1 metre in the coming century would not be unusual.

The frequency of tsunamis in NSW is very low but the consequences can be extreme. A tsunami is a series of waves that can be generated by sea-floor earthquakes (most common), sub-marine or coastal volcanic eruptions, meteor impacts and coastal landslides and slumps (State Emergency Service (SES), 2022).

Australia has been affected by over 50 tsunamis in the past 200 years. The largest Tsunami to have affected the NSW coast in recent times occurred in May 1960 after a 9.5 magnitude earthquake in Chile resulted in a 1 metre tidal fluctuation at Fort Denison in Sydney Harbour. This caused widespread damage to marine infrastructure along the NSW Coast including damage to boats, wharves, jetties and beaches (SES, 2022).

The Joint Australian Tsunami Warning Centre monitors earthquakes that could potentially cause tsunami, and issues warnings accordingly. The NSW SES in partnership with local governments, has developed evacuation areas across most coastal areas of NSW which can be accessed via the NSW SES website.

Understandably, large stretches of the Eurobodalla and Bega Valley coastlines are exposed to various coastal processes and hazards, though vulnerability varies depending on the extent of coastal development and marine industries that are established in various locations.





Drought

Drought is regarded as one of the most challenging recurring conditions in Australia, with profound consequences for human health, mental health more specifically, and for the economy.

Drought is pervasive, recurring and distressing. It is difficult to determine a start and end, and when the landscape has recovered. As for other disasters, they are difficult to predict or compare with differences in seasonality, extent, duration, severity, among other variables all contributing to the drought experience.

Australia has highly variable rainfall records and in contrast also has highly variable periods of low rainfall.

The Bureau of Meteorology has four definitions of drought, which are:



meteorological



agricultural



hydrological



socio-economic

There are also different phases of drought. The initial phase is a 'non-drought' category where all indicators suggest good conditions for production to recover, through to a 'drought affected' (weakening or intensifying) category, a 'drought' category and into an 'intense drought' category where rainfall, soil water and plant growth are below the 5th percentile (DPI, 2018).

There is a significant history of drought in South East NSW. Rainfall across the region is variable, with an average of around 600 millimetres per year. However, as locals know, there is no such thing as 'average' conditions in this part of the world.

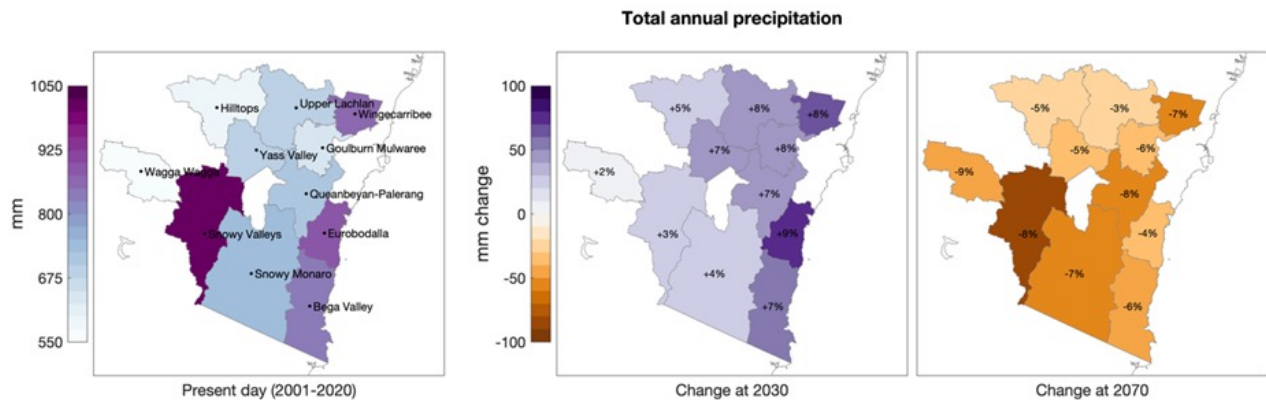
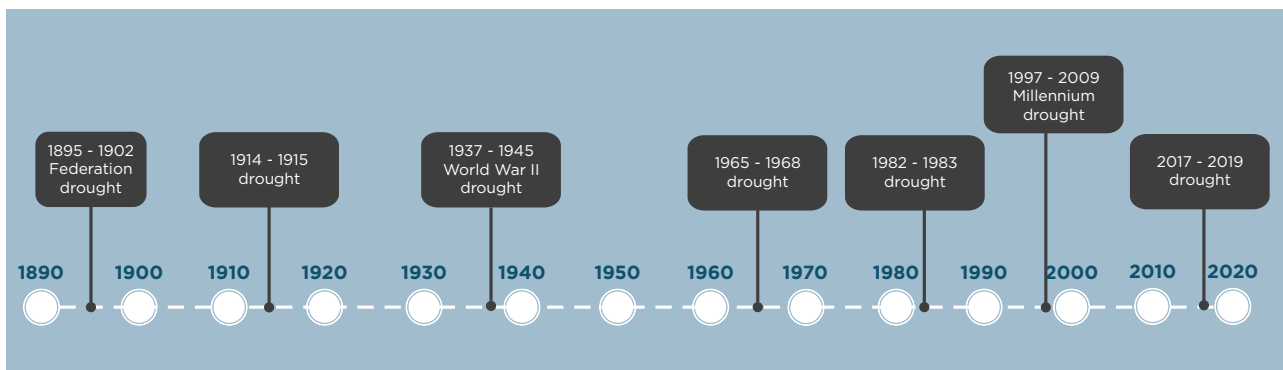


Figure 23 - Total annual precipitation in millimetres per year. Values are 20-year averages on the displayed year, such that 2030 is the mean of 2021 to 2040. Projections are the ensemble mean 20-year averages from a 2-3 degree warming scenario (RCP4.5)

Some of the most impactful droughts in Australian history have affected South East NSW. These include:



In all cases these drought events were characterised by protracted periods of low rainfall, leading to low soil moisture and strong relationships with heatwave and fire weather conditions.

Because the future is uncertain, climate models help us to consider potential future scenarios to support resilience plans that account for multiple situations that may eventuate. Scenarios are also a powerful way to explore how drivers of change or trends, be they socio-demographic, economic or environmental, may influence possible futures of the region, and how these may interact with the impacts of drought.

Drought conditions are expected to worsen across South East NSW under a warming climate. Across the region, inland LGAs, especially Wagga Wagga, Hilltops and Yass Valley, are more exposed to drought compared with coastal LGAs and higher altitude LGAs. Under future climate projections, by 2070 the magnitude of drought will increase across all LGAs and especially those already most affected being Wagga Wagga, Hilltops, Yass Valley and Upper Lachlan. Soil moisture declines by 2070 are modelled for all seasons, with the greatest during the winter and spring.

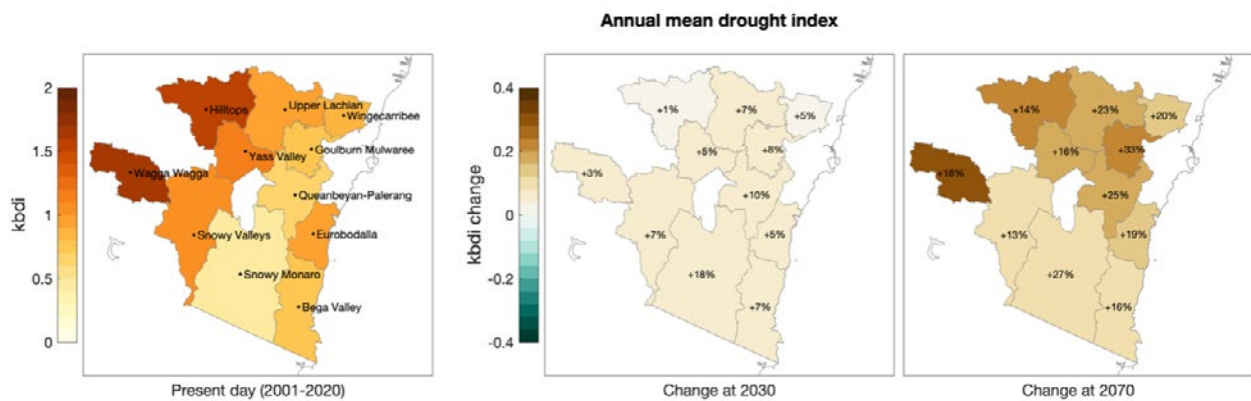


Figure 24 - Annual mean Keetch-Byram index value normalised on a scale of 0-10, where 10 is the maximum drought possible. Values are 20-year averages centred on the displayed year, such that 2030 is the mean of 2021-2040. Projections are the ensemble mean 20-year averages from a 2-3 degree warming scenario (RCP 4.5)

Total annual rainfall is also a major factor in regional water security and drought. Under present day climate, total annual rainfall across South East NSW is 744 millimetres per year and tends to be lowest at the more inland and lower elevation LGAs of Wagga Wagga, Hilltops, and Upper Lachlan, and higher at Snowy Valleys and coastal LGAs of Bega Valley, Eurobodalla and Wingecarribee. Under future climate projections, by 2070 rainfall may decrease in the spring, and could possibly increase during summer.

Changes in total annual rainfall are less than the projected changes in soil moisture and drought, suggesting that the increase in drought is being driven primarily by increasing temperatures and their effect on evapotranspiration.

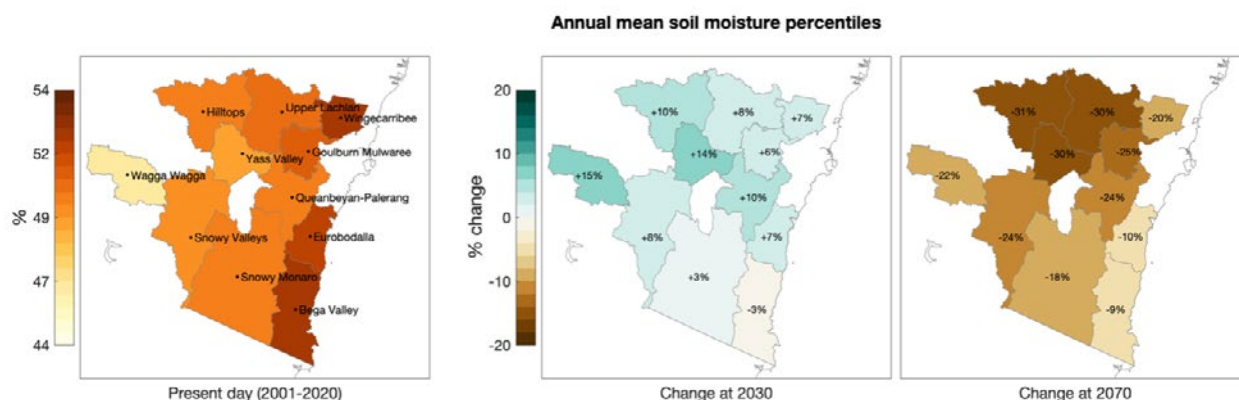


Figure 25 - Annual mean soil moisture percentiles. Values are calculated relative to the WMO 30-year standard reference period of 1991-2020. Low values at 2070 are indicative of a drying landscape. Values are 20-year averages centred on the displayed year, such that 2030 is the mean of 2021 to 2040. Projections are the ensemble mean 20-year averages from a 2-3 degree warming scenario (RCP 4.5)

Projections for increases in drought intensity will create a range of issues and adaptation challenges for most LGAs, including decreased flow into catchments, reducing water availability while increasing demand for municipal, industrial and irrigation requirements. Severe and protracted drought also increases the risk of soil compaction and damage to subsurface infrastructure such as sewer and water mains and contributes to socio-economic stressors, especially to the agricultural sector.

Landscape-wide drought threatens ecological systems and is a leading factor in forest dieback. Dry landscapes are also more susceptible to bushfire. Much of South East NSW cultural heritage is connected to the biophysical environment. Drought and increased risk for forest dieback and bushfire may threaten important cultural heritage, including scar trees.

DROUGHT RESILIENCE PLANNING

The Regional Drought Resilience Plan is a collaboration between Hilltops Council and Upper Lachlan Shire Council, working together to advance the region's focus on and future resilience to the impacts of drought. The Drought Resilience Plan is a sister plan of the Resilience Blueprint, and helps the entire region to adapt to the specific impacts of drought.

It is one of three initial drought resilience planning pilots in NSW which will help guide local and regional approaches across the rest of the state. The NSW RDRP program is jointly funded through the Australian Government's Future Drought Fund and the NSW Government, supporting local governments to work together regionally to plan for drought resilience proactively and pragmatically.





Earthquake

Whilst relatively infrequent, earthquakes occur across the region, creating significant damage,. In 1860, a magnitude 5.0 earthquake occurred in Yass which caused minor damage at the time but fast-forward to today, an earthquake of that magnitude could lead to substantial damage and loss. The earthquake could be felt as far away as Bathurst and Queanbeyan, with four aftershocks also felt (Yass Courier, 1860).

Also in 1860, a separate earthquake was reported in Araluen with events in subsequent years in Queanbeyan in 1872 at an estimated magnitude of 3.5, and 1883 between Crookwell and Goulburn with an estimated magnitude of 5.2 (McCue, 2013).

Further events have been reported in Berridale in 1885 at a magnitude of up to 4.7, a 5.3 magnitude event in 1893 in Tumut and a 3.5 magnitude event in 1894 in Cooma, and two events in 1897 in Queanbeyan and Cooma. An event in 1902 in Young reportedly startled sleeping residents during the night (McCue, 2013).

In 1910 a magnitude 4.5 earthquake occurred, its epicentre near Adaminaby, but felt from Kosciuszko to Queanbeyan. Cooma was once again shaken in 1931, however a major event also occurred in the same year with an epicentre near Boorowa which resulted in a landslide at Mt Bobbra where about two acres of land fell into a valley. Heavy rainfall in the same period is likely to have contributed to the landslide. The earthquake was felt in Yass and Binalong (McCue, 2013).

In 1933, a magnitude 4.8 earthquake in the Dalton / Gunning region caused substantial damage to homes and other buildings and felt as far away as Bondi and recorded on seismographs at the Sydney and Riverview observatories. More than 21 aftershocks were felt across the region. This event was the first of a 50 year period of high seismic activity in the region including two separate events at Harden and Gunning in 1935, Canberra in 1940 and Crookwell again in 1954 (McCue, 2013).

The South East NSW region forms part of Australia's most earthquake-prone regions according to Geoscience Australia's National Seismic Hazard Assessment 2018. This assessment defines the level of earthquake ground shaking across Australia that has a likelihood of being exceeded in a given time period. Knowing how the ground-shaking hazard varies across Australia allows higher hazard areas to be identified for the development of mitigation strategies so communities can be more resilient to earthquake events (Geoscience Australia, 2018).

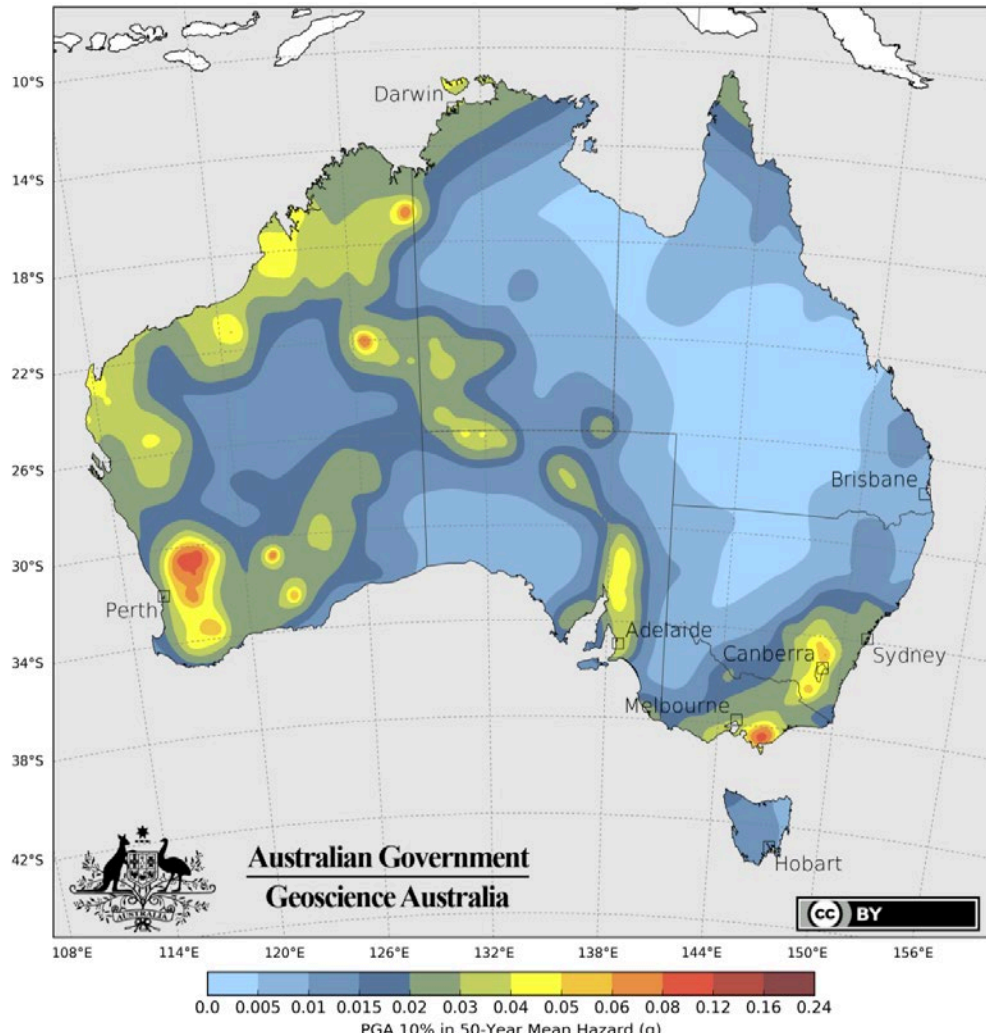


Figure 26 – 10 per cent in 50 year seismic hazard mapping (Source: Geoscience Australia, 2018)

The South East's probability of earthquakes in part owes to its proximity to Lake George which is one of Australia's most active faults measuring over 80 kilometres in length from around Goulburn to Queanbeyan. The smaller Queanbeyan Fault and another at Murrumbidgee are also active but noting, seismic activity is measured in time scales of hundreds, thousands and into millions of years (Geoscience Australia, 2018).

The 1989 Newcastle earthquake measured a magnitude 5.6 on the Richter Scale and is one of the worst disasters in Australian history. The Newcastle earthquake catalysed sweeping changes to Australian building standards. Whilst building standards for earthquake were originally introduced in 1979 it only applied to an area of Western Australia. The Building Code of Australia was revised in 1994 following research after the Newcastle earthquake and its impacts, introducing earthquake provisions across Australia.



Landslide

Landslide, landslip and subsidence is of a low likelihood across the region, but it can and has occurred, and will continue to do so over time. Landslides can occur for a range of reasons, including as a result of earthquakes, after heavy rainfall and due to poor soil drainage. It can also occur in disturbed areas where vegetation, which holds soils in place, is removed or cleared.

Historical events in the region include land slippage following earthquakes in the 1900's, and following the 2019-20 Black Summer bushfires, particularly in the Snowy Valleys region, where slopes and hillsides gave way, damaging roads and causing periods of isolation for some residents and communities. The loss of vegetation and impacts to soils led to significant erosion and instability which was exacerbated when rain fell shortly after the fires.

The most devastating landslide event in Australia was the Thredbo disaster in 1997 which claimed the lives of 18 people, with one survivor, in the Snowy Mountains. The landslide occurred at 11:40pm when part of a road embankment slid down the steep hillside into a ski resort village.

Landslide is a cascading risk which usually has a strong association with another hazard, like an earthquake or heavy rainfall but steep slope and soil assessments can support engineering measures where appropriate, and help to avoid inappropriate risk where relevant.



Biological hazards

Biological hazards are relevant to people and other living organisms.

From a human health perspective, epidemics involve the rapid spread of infection disease. Epidemics become pandemics with the expansion to worldwide populations affecting large numbers of people.

These biological hazards generate significant pressures in terms of public health, health care systems and mental health. From a disaster perspective many cascading risks are often associated including economic, supply chain and cultural and human behavioural challenges.

These occurrences are generally of low frequency but when they do occur the breadth and depth of impact is widespread as has been the case during the COVID-19 global pandemic. Its impact has brought with it added complexity for recovery efforts from years of persistent drought, the Black Summer bushfires and more recent flood events. These events have shown the importance of building resilience to systemic and cumulative disaster risk.

Disease spread and human health risks are also common after other types of disaster events, particularly where drinking water and sanitation infrastructure networks are disrupted, damaged or lost.

Impacts from disaster impacts on industrial activities and land uses can also lead to human health concerns, as well as contaminating land and waters.

Beyond human health, impacts of biological hazards are vast and common for plants and animals, and the ecosystems on which they rely. Hence the value of and commitment to biosecurity controls across South East NSW. Weed and pest outbreak are continuous areas of focus from a property level through to government policy and industry practices. Animal disease is a key challenge, as well as exotic plant diseases and spread of exotic pest animals. Strong biosecurity measures at all levels is paramount in avoiding, mitigation and managing plant and animal biological hazards.



INDICATORS OF PREPAREDNESS

The Get Ready NSW Baseline Research project was commissioned by the NSW Rural Fire Service (NSWRFS) to provide a quantitative analysis and insights into the preparedness of NSW households to respond and react to the threat of bushfire, home fire, flood or storm.

A total of 4,937 telephone interviews were conducted between 13 August and 6 October 2020. The data was aggregated at the Joint Organisation (JO) of Council level with Canberra Region Joint Organisation accounting for 13 per cent of responses.

A framework of six levels of preparedness were developed, with a 'level 0' representing a household that did not believe they were at risk from particular hazard, to 'level 5' where a household has a detailed plan, have initiated some actions to prepare their home in case of a hazard and have engaged in advanced preparatory actions and / or are involved in advocacy or volunteering related to hazard preparedness.

Key insights drawn from the survey for the South East NSW region include:

- of the four target hazards in the region, most respondents were more likely to believe they were at threat from bushfire (43 per cent stating the threat was high or very high) or severe storm (36 per cent stating the threat was high or very high). This compared to 6 per cent for a house fire and 3 per cent for flood.
- the results indicate the younger age cohort (18-29 years) and older age cohort (70+ years) are the least prepared. The researchers behind the survey hypothesise that the younger (18-29) age cohort is less prepared to a lack of experience or knowledge, while amongst the older (70+) age cohort there could be physical challenges with implementing plans or a lack of social connection, leading to being less prepared.
- members of the culturally and linguistically diverse (CALD) community (identified by the survey by those who speak a language other than English at home) had significantly lower levels of preparedness for a bushfire and flood than those who speak only English.
- preparedness for flood was considerably lower than preparedness for all other hazards with 64 per cent of households identifying themselves at 'level 0'. That is, they consider they are at a very low or no risk of flood.

The above provides some interesting insights, particularly in light of flood risk which is the leading risk in the region in terms of fatalities and infrastructure costs, but preparedness for flood in the region is considerably lower than for other hazards.

In real terms, preparedness for disaster tends to increase immediately following an event, as perceptions, experiences and concerns are heightened. Over time, levels of resilience and preparedness can be affected by complacency as time passes by without impact.

What we are starting to see however, are consecutive and compounding events that are limiting our ability to recover before we experience another shock or stress. This creates other challenges for our levels of resilience, as fatigue increases.





SECTION 3



WALKING THE BLUEPRINT JOURNEY

OUR JOURNEY OF 'RESILIENCE'

Our views on 'resilience' in South East NSW are born of a long history of experience with different natural hazards. Landslides, heatwaves, earthquakes, coastal hazards, disease outbreaks and biosecurity also present challenges to resilience.

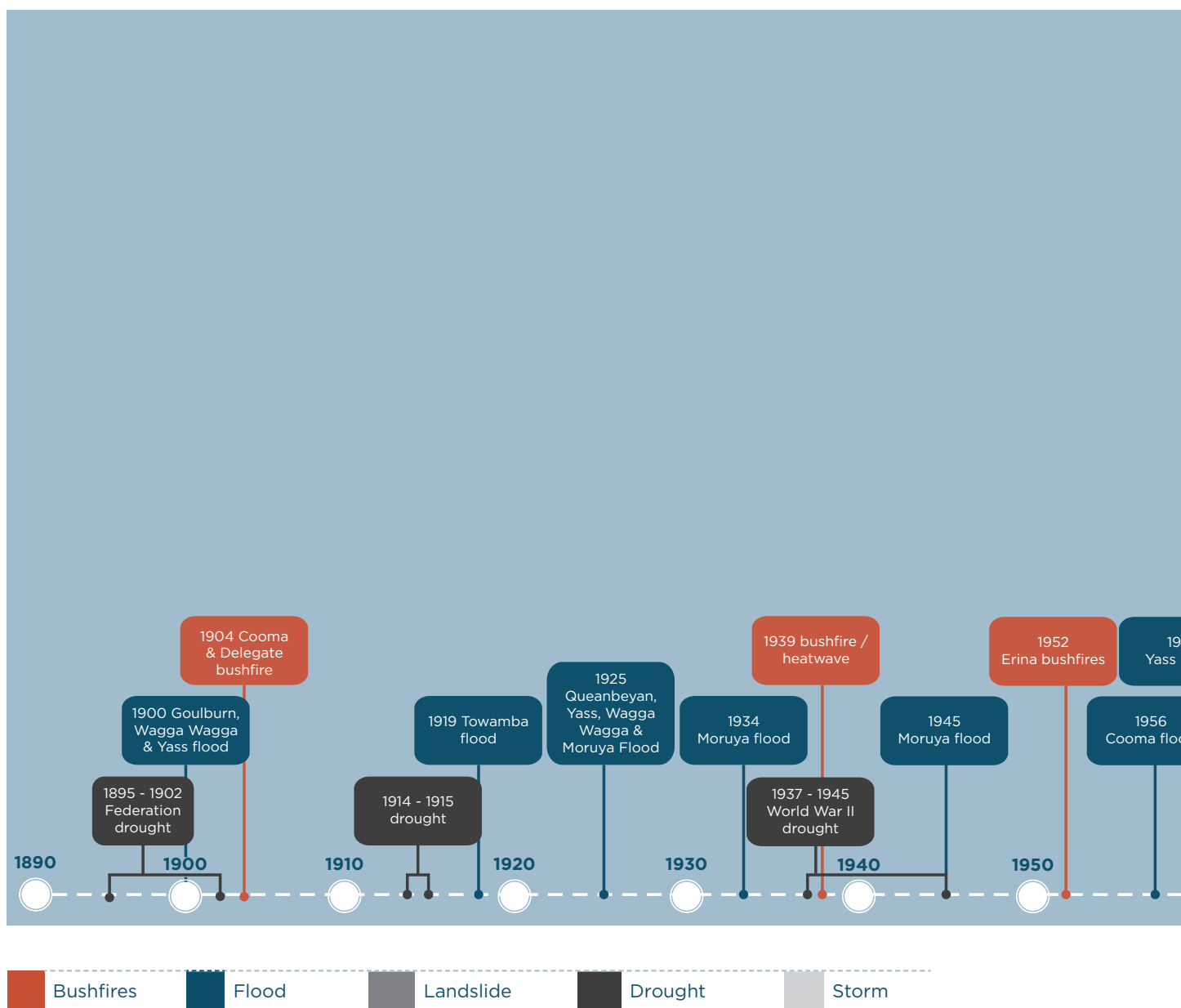
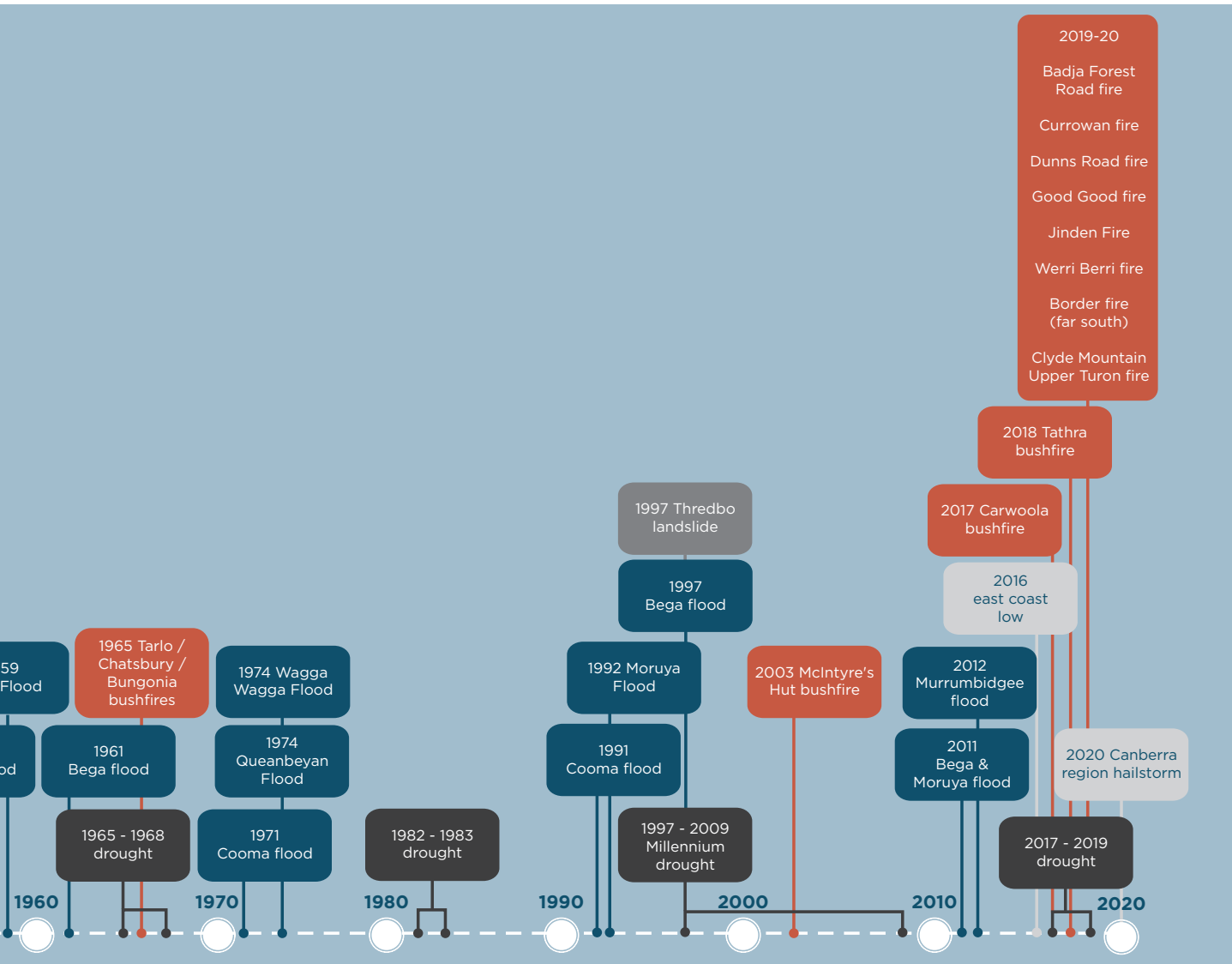


Figure 27 - A snapshot history of reported disaster events in South East NSW (Source: Risk Frontiers, 2022)

Not all natural hazard events are disasters. How the landscape operates, its natural processes and our relationship with and respecting the landscape and its natural functions. Indigenous knowledge of the region has changed. Weather and natural processes, along with climatic shifts, have shaped South East NSW.

natural hazard events. The South East is a region of drought, fire and flooding rain.
nt risks across the region.



climatic and weather factors can be perceived as hazards. Resilience is also about having empathy
xtends back many tens of thousands of years, as the first inhabitants. Over this period, Country has

The term 'resilience' raises different thoughts, emotions and reactions. It means different things to different people. It is often associated with how we 'stand up' to an event, or how we are tested, endure and withstand. Whilst it is those things, it involves more.

Whilst we often hear the term 'resilience' used after a disaster, we need to think of it in different contexts. Part of our need to adapt to a changing world is the increasing frequency and consecutive nature of events. The cascading nature of risks stemming from cumulative events brings new challenges. There are also opportunities to catalyse a more resilient future.

How we view the term 'resilience' and how we each characterise it is defined by our own lived experiences, values and knowledge.

Across South East NSW, we define our resilience across the dimensions of:

- being forward-thinking
- anticipating change
- investing in proactive effort.



MOVING ALONG THE RESILIENCE JOURNEY

Our resilience journeys are as unique as we are. We start at different points, go at different speeds and focus on different priorities as we progress. As we grow and build on our resilience opportunities over time, the more transformative our approaches become.

Resilience is a journey. We may feel more resilient to different challenges at different times in our lives.

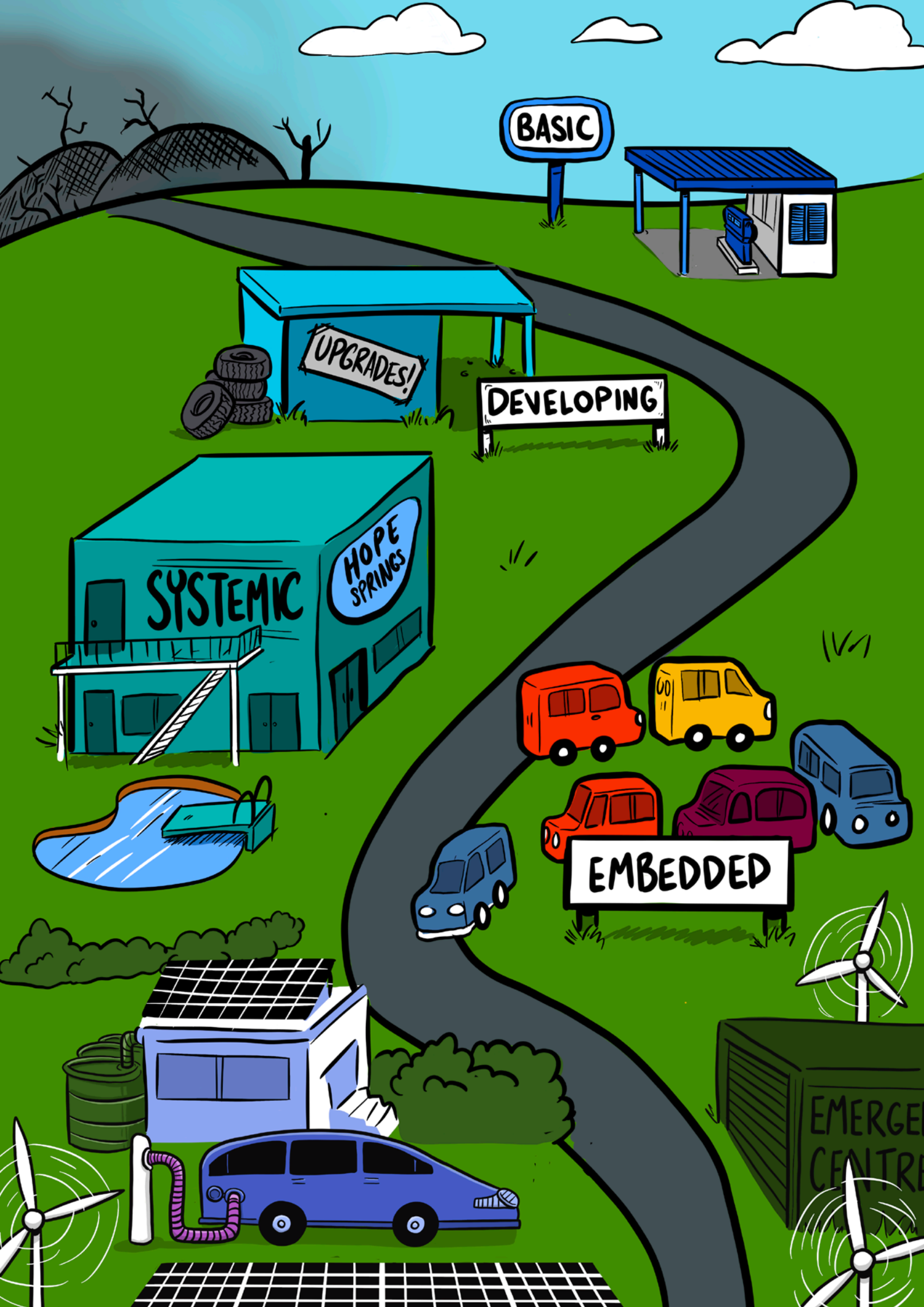
Surveys across the region¹ show climate change and adaptation are high priorities for communities. We have experienced climate-driven disasters of an extreme scale here in South East NSW. Building our resilience to a changing global climate, and global warming, is front of mind.

Equally apparent are the sustainability challenges of the economic dimension of disaster impacts. Deloitte Access Economics (2022) models the total economic costs of disasters in NSW from 2020-2060 to be between \$320-\$391 billion, depending on emissions scenarios. Even in a low emissions scenario, this is a cost to NSW that is unsustainable.

Working together, we have the opportunity to move forward along our resilience journeys. We can harness opportunities and proactively fill emergent gaps in the face of a range of stresses and shocks that may affect us, to be better placed when they occur.



² Community Strategic Plan Survey (Canberra Regional Joint Organisation), Regional wellbeing survey (University of Canberra) and Resilience Blueprint community survey (Canberra Region Joint Organisation)



BASIC

UPGRADES!

DEVELOPING

SYSTEMIC

HOPE SPRINGS

EMBEDDED

EMERGENCY CENTRE

OUR STATEMENT OF RESILIENCE

Disaster risk reduction is a challenge we all need to embrace. Being climate-ready in South East NSW means we are aware of the risks we face now and into the future, and are committed to proactive and flexible change management. This allows us to adapt to both rapid and slow onset shifts in ways that consider the dynamics of our communities.

We maintain an awareness that nothing is fixed. The environment we live in, our communities, economic conditions, built form and infrastructure are constantly evolving. And so too must be our approaches to our ongoing resilience.

How stress factors or natural hazard events will impact us will change as our circumstances change over time. This is because of the systemic and interconnected nature of the world we live in, and hence the need for our focus on systemic risk and systems-based resilience. This allows us to have a mind to the cumulative and cascading risks that require our attention, just as much as any single immediate event.

We have spent enough time, effort and emotional toil recovering from events to know the value of a proactive and forward focus.

We also know the pain of recovery as a process, and we know that ‘recovery’ is often just a word. Sometimes we can’t recover what has been lost. Resilience shouldn’t be about how we stand up to impacts and loss. It should be about the many and varied opportunities we seek everyday to avoid and mitigate future loss.

This is why, across South East NSW, we are making a commitment to drive resilience change.

We commit to taking action to build upon this Blueprint and embed resilience processes in everything we do, from government activities through to business processes, natural resource management and across communities and households. We all have a stake.

We will adapt our resilience approaches as things change. Driving resilience change means we are shaping a new reality for ourselves and as we evolve, and our circumstances change, so too we will ensure we adjust our resilience habits to keep pace.

Resilience is not static and doesn’t necessarily come naturally. We have to work at it. We will do this collaboratively, strengthening our connections with each other, the landscape and the climate we live in and their respective processes. We will identify and leverage opportunities for step change.

Together, we are investing in a more resilient tomorrow.

HOW THE BLUEPRINT WAS DEVELOPED

The South East NSW Resilience Blueprint was developed following the devastating 2019/20 Black Summer bushfires and onset of the COVID-19 global pandemic, both of which have had enduring impacts on communities across the region.

The Blueprint is co-designed through a partnership approach that involves community, business and government, across different disciplines, interests and sectors.

The co-design process across South East NSW led to the identification of five key attributes of the Resilience Blueprint. These are that it:

1. addresses climate change as a priority
2. is grounded in lessons learnt
3. has key decision-maker support
4. is developed collaboratively with councils and communities
5. aligns with Commonwealth, state and local government initiatives.

The co-design and Blueprint development processes gathered insights, experiences, knowledge and perspectives from a broad spectrum of community leaders and representatives, knowledge specialists, researchers, First Nations, local businesses, not for profits and non-government organisations, youth groups, generational land holders and representatives from across all levels of government. All with different but deep commitments to the wellbeing of South East NSW.



RESILIENCE BLUEPRINT ENGAGEMENT SNAPSHOT:

OVER 2,072 PARTICIPANTS



431



WORKSHOP PARTICIPANTS

345



ONLINE SURVEY PARTICIPANTS

285



ONLINE PANEL PARTICIPANTS



11



COUNCILLOR BRIEFINGS

13



DROP IN SESSIONS

11



COUNCIL WORKSHOPS

12



COMMUNITY WORKSHOPS

WORKING WITH THE ACT GOVERNMENT

There is a history of strong collaboration between Australian Capital Territory (ACT) Government and local and state government in NSW on emergency management and climate change preparedness. It has been a regular feature of the ACT-NSW Memorandum of Understanding for Regional Collaboration over multiple years, through the NSW Office of the Cross-Border Commissioner, Department of Regional NSW and the Chief Minister, Treasury and Economic Development Directorate (CMTEDD).

The ACT Government has contributed to the shaping of the Resilience Blueprint from inception and with collaboration from the Regional Policy and Wellbeing teams within CMTEDD, the ACT Emergency Services Agency, Climate Change Policy and the Office of Climate Action. The ACT Government is an associate member of the Canberra Region Joint Organisation and is also represented on the NSW Risk and Resilience working group which is the Advisory group to Resilience Blueprint.

The Resilience Blueprint aligns with the ACT Climate Change Adaptation Strategy 2016 which identifies actions associated with similar system environments, and towards that of the 2018 ACT Longitudinal Survey on Climate Change which measured the climate resilience of ACT residents and the Canberra University Regional Wellbeing Survey. The Resilience Blueprint will continue to build on the strong collaboration foundation that currently exists and will continue to seek opportunities to enhance the resilience of communities in both the ACT and the SE region.

Supporting this comprehensive co-design and Blueprint development process is an analysis of available climate risk data for each local government area, forming part of the resilience assessment. This not only considers long-term natural hazard-related climate projections but an analysis of event likelihood and vulnerability so that we can better understand our potential risk profile across South East NSW.

The local perspectives and analysis of available climate risk data elements informing the resilience assessment within Blueprint are matched by taking a resilience lens to our social, economic, built and natural environment, and governance systems.

A number of resilience methodologies are leveraged by the Resilience Blueprint to derive a bespoke but technically robust approach to contemplating our region's resilience drivers. The national and international frameworks which have contributed to the South East NSW Resilience Blueprint delivery approach include:

- CSIRO's RAPTA process
- Australian Institute of Disaster Resilience (AIDR) Adaptive Learning process
- Minderoo Foundation's Community Resilience Framework
- Resilient Cities Network City Resilience Framework
- Organisation for Economic Co-operation and Development (OECD) Guidelines for Resilience Systems Analysis.

USING THE BLUEPRINT

- The Blueprint may be used differently in different contexts and by different stakeholders for a variety of resilience purposes.
- Over time, the Blueprint will navigate across separate spheres of influence. The first being the influence of dynamic elements of communities, economies and landscapes, and the changing risk and resilience context these generate. The second is the direct influence of the function of the Blueprint in addressing the priorities and strategies to support South East NSW to adapt to a changing world.
- Measuring these influences and dynamic systems through implementation pathways, by identified indicator metrics, allows us the opportunity to:
 - track our resilience successes over time
 - understand when to consider intervention options, and how they might be undertaken (trigger points for resilience step-change)
 - how communities and system processes are tracking along the resilience journey
 - how resilience is being maintained, modified and transformed to meet new needs and changed circumstances
- when adaptive governance approaches are required.

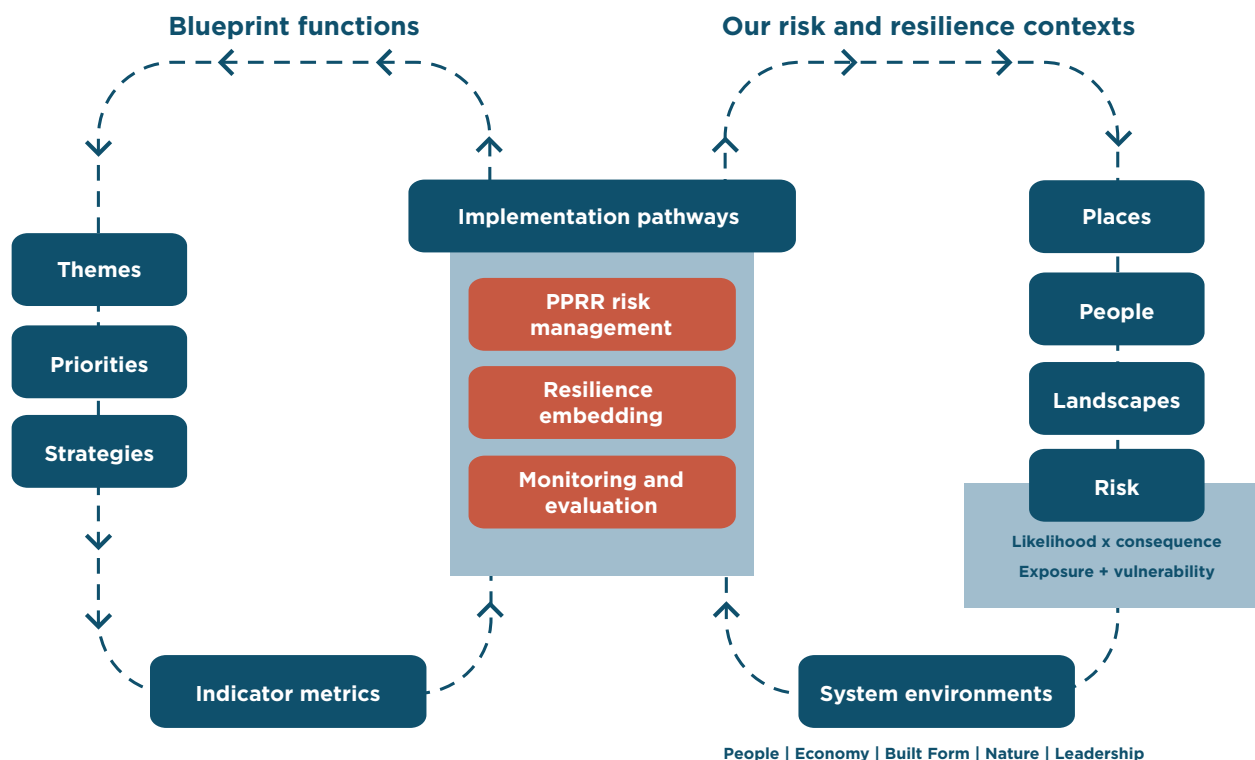


Figure 28 - Evolving cycles of influence and implementation as part of continuous improvement

Applying a resilience lens to everything we do enables us to unlock opportunities and achieve enhanced and coordinated outcomes for aspects like risk avoidance and mitigation, climate adaptation, socio-economic prosperity and ecosystem and biodiversity health.

Investment in resilience reduces the economic and social impacts of disasters and promotes better outcomes for people and communities (Deloitte, 2022).

BENEFITS FOR LOCAL GOVERNMENT

	Locally and regionally specific risk and resilience data availability
	Support for embedding resilience into operations, processes and decision-making
	Enhanced foundations for resilience capability and capacity
	An evidence base to underpin needs for betterment and building back better
	Metrics for monitoring, evaluation and adaptation
	Identified resilience priorities and strategies for funding
	An advocacy platform to facilitate systemic change

BENEFITS FOR HOUSEHOLDS AND COMMUNITIES

	Greater understanding of risks to support preparedness
	Awareness of stress factors for communities, and how these amplify and influence the impacts of natural hazard events
	Enhanced foundations for resilience capability and capacity
	Transparency on roles and responsibilities in resilience
	Clarity with regard to the contribution individuals, households and communities can make
	An understanding of the collective objectives that different parties are working toward that make 'resilience' tangible

BENEFITS FOR ORGANISATIONS, SERVICES, BUSINESSES AND THE PRIVATE SECTOR

	Articulation of the resilience challenges which require specialist focus
	Risk and resilience factors that are relevant for service continuity planning
	Enhanced foundations for resilience capability and capacity
	Opportunities to drive toward enterprise and industry resilience
	Clarity with regard to the contribution organisations, services and businesses can make
	Identified resilience priorities and strategies for funding
	An advocacy platform to facilitate systemic change

BENEFITS FOR STATE AND FEDERAL GOVERNMENT

	Locally and regionally specific risk and resilience data and intelligence
	Clarity on the risk and resilience challenges and opportunities specific to South East NSW
	An evidence base to underpin future recovery and reconstruction priorities
	Opportunities to deploy multi-disciplinary support to bolster local and regional outcomes that align with resilience aspirations
	Insight with regard to the systemic interrelationships across risk and resilience dimensions
	Pre-identified resilience priorities and strategies to align funding to need
	A foundation for the consideration of improvements to enhance innovation

MATURING OUR RESILIENCE JOURNEY

The Resilience Blueprint implementation framework comprises three pathways:

- state and local government ‘prevent, prepare, respond, recover’ (PPRR) risk management frameworks
- resilience embedding processes into business as usual
- monitoring and evaluation practices.

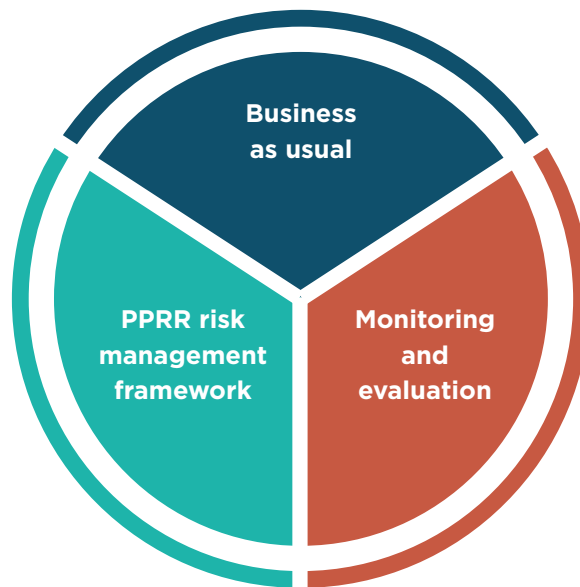


Figure 29 - Resilience Blueprint implementation pathways

The Canberra Region Joint Organisation will lead the initial phases of region-wide implementation, working with stakeholders to navigate their forward journey with the assistance of the Resilience Blueprint and its resilience directions framework.

Over time, the implementation pathways will enable an integrated approach, where resilience is calibrated as part of business as usual processes, providing for the succession and sustainability of effort over time across government and other activities.

IMPLEMENTATION FRAMEWORK

Delivery of the Resilience Blueprint requires collective effort, in contribution to regional aspirations. To achieve this, and acknowledge the different resilience roles, responsibilities, journeys and needs involved across the region, the 'directions framework' of the Blueprint is designed to enable opportunities that can be explored and taken forward to embed as part of day-to-day processes.

This allows a quantum of effort to be undertaken by different people and organisations, in different ways and at different times, in the knowledge it is contributing towards collective regional resilience outcomes.

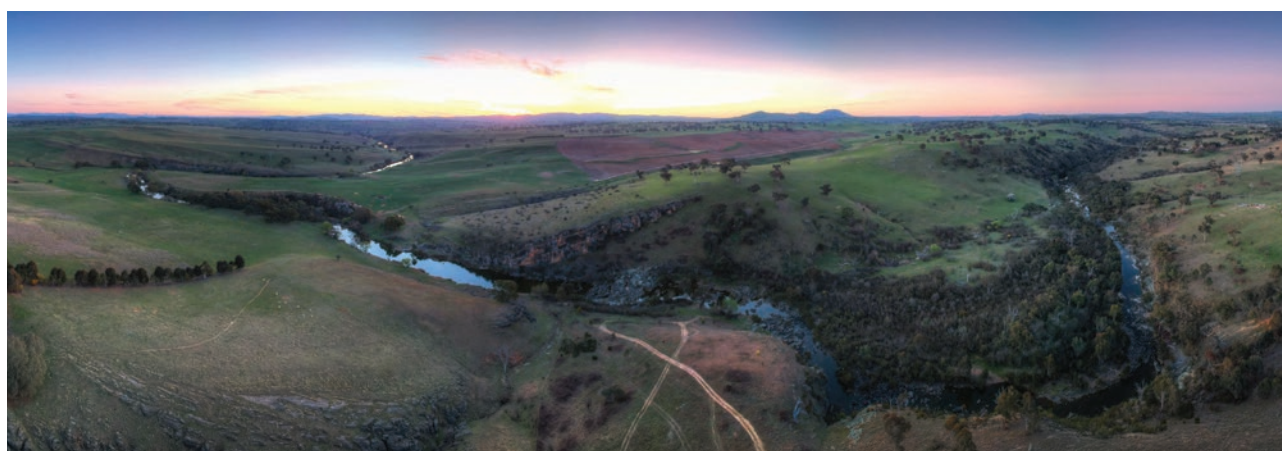
The directions framework spans five (5) system environments and is supported by:

- 15 resilience themes
- 30 priorities
- 168 strategies.

A suite of tools and defined indicator metrics are provided to support implementation at all levels.

The strategies contained within the directions framework enable everyone with a role to play to identify those opportunities that are relevant to their context, allowing an adaptable framework whether for state or local government, the private sector, community groups or households.

Over time, the implementation pathways will enable an integrated approach, where resilience is calibrated as part of business as usual processes, providing for the succession and sustainability of effort over time across government and other activities.



PPRR risk management frameworks and processes

The principles for emergency management in NSW under the EMPLAN is based upon a comprehensive ‘prevention, preparation, response, recovery’ framework model that also links with the NSW Resilience Plan.

PPRR approaches are adopted by all agencies with responsibilities under EMPLAN in NSW and in this way, it filters across many different aspects of emergency management and disaster risk reduction. It involves:

- Prevention: to eliminate or reduce the level of the risk or severity of emergencies
- Preparation: to enhance capacity of agencies and communities to cope with the consequences of emergencies
- Response: to ensure the immediate consequences of emergencies to communities are minimised
- Recovery: measures which support individuals and communities affected by emergencies in the reconstruction of physical infrastructure and restoration of physical, emotional, environmental and economic well-being.

Using PPRR approaches as a vehicle for implementation of the directions of the Resilience Blueprint for those with a legislative and regulatory role in emergency management provides a key pathway towards step change over time.

Resilience embedding

The embedding process of the Resilience Blueprint is focused on mapping the opportunities to embed the resilience directions in decision-making.

This implementation pathway is funded by Bushfire Community Recovery and Resilience Fund and the Bushfire Local Economic Recovery Fund, as the next phase of delivery of the Resilience Blueprint project.

The embedding process will work with stakeholders including local governments and communities around how we take the directions of Resilience Blueprint and apply it to address specific local circumstances. It will support councils to develop local IP&R integration plans that work towards resilience implementation over time, identifying where funding is required and outlining the resilience case for efforts.

Resilience embedding approaches and local action plans will consider elements of:

- control, influence and advocacy
- immediate, medium and long-term transformation efforts
- activities that:
 - maintain momentum
 - modify resilience outcomes
 - contribute to transformational change where it is required.

Monitoring and evaluation practices

In South East NSW, we will know we are enhancing our resilience when we:

In people and communities:

1. have a greater understanding of risk
2. are recognising lessons learned as opportunities to grow resilience
3. are empowering people and communities to have a role
4. are harnessing local solutions to local issues.

In governance processes:

1. establishing evidence in the context of community values and commitments, and available funds and resources
2. ensure decision-making processes and priorities are informed by risk-based evidence
3. are adopting coordinated and collaborative approaches
4. have adaptive governance that flexes with changed circumstances
5. see funding directed to resilience needs.

This will require behavioural changes that adopt resilience as a cornerstone mindset across everything we do.

To track performance against the Resilience Blueprint, a monitoring and evaluation plan will be developed alongside the embedding process, working with stakeholders to develop the indicator metrics contained within the directions framework of the Blueprint into measurement tools.

The measurement approach and monitoring and evaluation framework will monitor community resilience over time, with linkages to the directions of the Blueprint so that its implementation can also be monitored and measured.

Indicators will be group together under themes relating to:

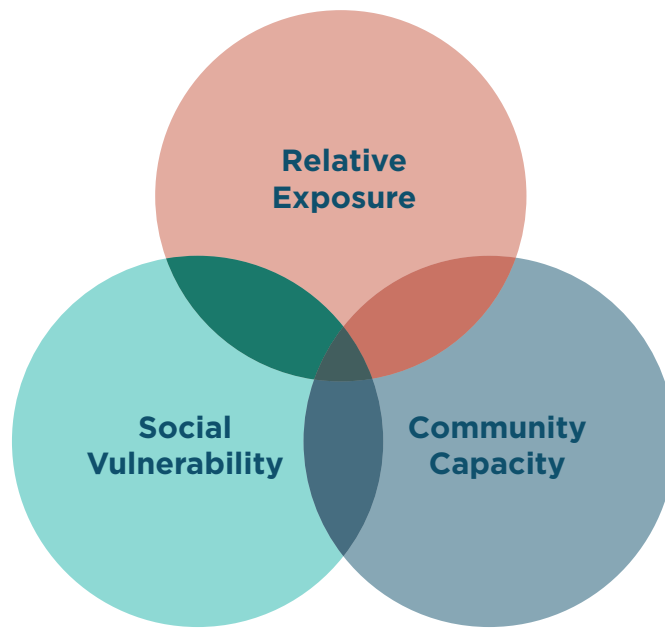


Figure 30 - Resilience measurement framework

The measurement framework will enable a view of maturation of resilience, enabling stakeholders to quantify how resilience maturation is occurring.

The implementation framework is a key strength of the South East NSW Resilience Blueprint, ensuring a focus on 'doing' is maintained and bring the directions of the Blueprint into sharp focus, guiding synchronised approaches for the benefit of the entire region.

As the journey advances and matures over time, so too will our resilience opportunities. The South East NSW Resilience Blueprint meets today's need to advance our resilience for tomorrow but over time and as progress is made, it will require revision in order to promote continue improvement.

Join us on the journey.

Together, we can adapt to a changing world.

ADDITIONAL TOOLS

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