Enhancing Community Resilience Toolkit

A toolkit for councils to help prepare communities for climate change impacts

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MINDEROO FOUNDATION

SECCCA
South East Councils
Climate Change Alliance

ACKNOWLEDGEMENTS

Contents

1 Summary

The Earth has warmed due to increasing atmospheric concentrations of greenhouse gases, with 2023 the planet's hottest year on record. Over recent decades, Australia's climate has become drier, there have been changes to the intensity and frequency of extreme weather events, and sea levels have risen. Climate change is significantly increasing risks such as fires, floods, coastal erosion, and heatwaves to communities throughout Australia.

The need to assess vulnerability and enhance community resilience to climate change is highlighted in local, state, national and international policy. Proactively preparing populations for climate change builds community resilience to future impacts and reduces risks and adverse consequences.

The Enhancing Communities Resilience (ECR) project aimed to prepare communities in Melbourne's South East Councils Climate Change Alliance (SECCCA) region for the impacts of current and future changes to the climate. It provided council participants and communities access to new or improved information, tools, services, and resources to help make decisions and apply practical actions to prepare for climate change.

The ECR project, funded by the Minderoo Foundation, built on the 2021 SECCCA Asset Vulnerability Assessment project by identifying and visualising the most vulnerable community sectors and services. The project raised awareness of adaptation needs, focused on who is vulnerable and why, and showed how to reduce vulnerability and build resilience across the entire community.

The project sought to help SECCCA councils to meet commitments for building community climate change resilience through better service delivery. It identified and visualised the community services, demographics, locations, and communities exposed to climate change.

The main tasks of the ECR project were to:

1. identify community groups within the SECCCA region that are vulnerable to climate change, and the assets and services that support them

2. identify best practice programs nationally and globally that have enhanced community resilience to climate change

3. develop a methodology that enables councils to assess the community impacts of climate change and develop appropriate responses

4. create software to enable climate modelling to be applied across the SECCCA region, and ongoing assessment of climate impact on community assets and services

5. establish a spatial representation of how climate change will affect communities and council assets and services

6. demonstrate how community resilience to climate change can be strengthened

7. develop and implement a community engagement strategy that informs and enables the community to understand, plan and act to build resilience to climate change

8. recommend visualisation tools for scenario and response planning and adaptation option analysis

9. undertake workshops and other activities with the community to trial and deliver priority case studies to improve community resilience.

The ECR project required:

- Resources: the funding for such an undertaking is significant and can be in the order of $1 million.

- Adaptive governance: a project lead, a control group, a working group, a technical reference group, a communications group, and project consultants supported the delivery of the project.

- Extensive, diverse data: project inputs included information on climate hazards, types of vulnerable populations, and the assets and services that support communities.

- Focus on policy-relevant information: council decision-makers need to be able to use the results.

- Mentoring of colleagues: council staff need guidance on using project data and outputs.

- Clear communication and plain language: engagement about the project and its outputs was planned for diverse audiences.

The ECR project was delivered in 5 connected phases:

1. scan materials, identify potential issues, and suggest solutions

2. collect data on the latest climate impacts, and priority populations and their vulnerability

3. plan the scope of the work and develop a communication plan

4. develop practical responses and case studies that help build resilience in vulnerable communities

5. develop this Toolkit, and an evaluation report, to identify lessons for other councils.

The process of bringing the data together to assess a community's vulnerability to climate change was:

1. Select a community, focus on a vulnerable population, consider the geographic scale of the project, and define the project's purpose.

2. Identify (and collate data for) a climate change variable or extreme weather event of concern.

3. Identify (and collate data for) assets and services to the community that increase resilience.

4. Identify (and collate data for) vulnerable populations, link these with the climate hazards of concern, include consideration of assets and services, and apply a vulnerability analysis framework to prioritise the populations most vulnerable to the hazards.

5. Apply a rating to each parameter based on the climate change event threatening the identified community.

6. Combine components in the analysis in a visual format, including tables, graphs, and interactive viewers.

7. Apply the findings to develop a business case, engage and work with the community, and take action.

Examples of the application of the ECR project by SECCCA councils demonstrate the range of different uses of project results, including: identifying areas susceptible to heat to upgrade buildings and protect vulnerable communities; guiding a program for young people to check on older vulnerable people who live alone, and analysing detailed and updated data to identify changes in urban heat to establish whether different locations and populations require different interventions and facilities as part of an urban cooling strategy.

The ECR project demonstrated how to use the project information in 4 detailed geographic case studies on the vulnerability of communities to a climate hazard scenario. These included heatwaves in the growth areas of Cranbourne East and Clyde North, bushfires in Cockatoo and Gembrook, inundation at Rosebud, and inundation south of Mordialloc Creek.

The project also completed 3 pilot projects to illustrate implementation. One project examined the best way for organisations to understand and use the findings. Another addressed the vulnerability of older people in a bayside council, identifying

refuges suitable for shelter during extreme weather and drafting an extreme weather readiness self-assessment checklist. A third project involved young people in Frankston City Council identifying ways to become more informed about, and resilient to, extreme weather events by producing a video for social media and school assemblies.

Actions to maximise the successful delivery of the ECR project's outcomes over the longer term include promoting the project, heeding the lessons learned, considering co-design carefully, ensuring leadership to maintain momentum, and developing the acquired and transferable skills.

The evaluation showed that the ECR project achieved its aims of delivering the data, information, tools, frameworks, and approaches needed to identify and help populations vulnerable to climate change. The project showed that councils can work constructively and collaboratively on complex and challenging climate vulnerabilities with the community to offer services that help build resilience. Once used to their potential, the resources now available to councils and communities will likely significantly improve community resilience.

This Toolkit documents the innovative activities of the ECR project, presenting its outcomes and approaches as a practical guide for other councils and communities to replicate in different regions. It tells the ECR project's story, identifying the steps required to scale the project to other regions and inspiring others to enhance community resilience to climate change. Scaling up these activities and applying them to other jurisdictions, potentially at a national level, will help build community resilience to climate change across Australia by improving community preparedness through practical actions, tools, and resources.

Lessons learned

Scale the enhancement of community resilience to other regions nationally using the template and lessons learned from this large-scale, regional pilot project.

Implement good project management, leadership, careful planning and adaptative governance are essential for success.

Co-design projects with communities as collaboration and connection are fundamental, and it is essential to ask, listen and learn.

Council relationships are essential, requiring constant engagement with council officers and leadership teams to ensure mandates for resourcing, risk management and embedding the findings into council practice and operations.

Understand the resources required, including council officers' time to analyse and understand the data, and proper funding for consultants.

Manage time and budget constraints by aligning data with council business plans to ensure resources support achieving the project goals.

Understand the data and how to use the findings to work with communities to improve council services, and acknowledge the limitations of data.

Use flexible and simple output platforms to analyse and use the resulting data.

Use a resilience framework such as the Minderoo Resilient Communities Framework in combination with the template (and Toolkit) from this project.

Pause and reflect mid-project to regroup, embed the lessons and findings into councils, and plan the project's remaining scope and delivery.

Adapt to new information but avoid scope creep.

Communicate often and clearly, internally and externally, tailored to the audience, using accessible language.

2 Checklist ✓

These instructions identify the essential steps throughout a project that enhance community resilience. Click on the text in each step to go to the relevant page in the Toolkit for more information.

Do you need to enhance community resilience?

Can you identify potential funding sources?

Can you apply a vulnerability assessment framework to your project?

Do you have a project plan identifying potential barriers and risks to undertaking your project?

Can you identify staff and stakeholders to govern your project?

Have you identified strategies and business units within your organisation that can use the results from this project?

How will you engage your council colleagues about using the project's output data tools?

Do you have information about climate change and its likely impacts on your region?

Have you considered relevant local and other laws and policies that could influence your project approach?

Have you researched other councils' activities to avoid 're-inventing the wheel'?

Can you obtain the required different types and geographic coverage of localised climate data?

Can you obtain the required types and geographic coverage of community demographic data?

Can you obtain the required types and geographic coverage of assets and services data?

Have you planned how to embed the project tools, outputs and insights into your council decision-making processes?

Have you and your colleagues considered possible solutions to the challenges faced by vulnerable communities in your municipality?

How will you collaborate with the community – is co-design an appropriate approach, and are you ready to implement a co-design project?

Have you considered internal and external communication, and do you need a communication plan?

How are you evaluating your project – what are your measures of success?

How will you promote impact and ensure the long-term success of your project?

3 Roadmap: project plan on a page

A project to enhance community resilience should be a 24-month process to fully embed the findings and co-design results into council or organisation processes.
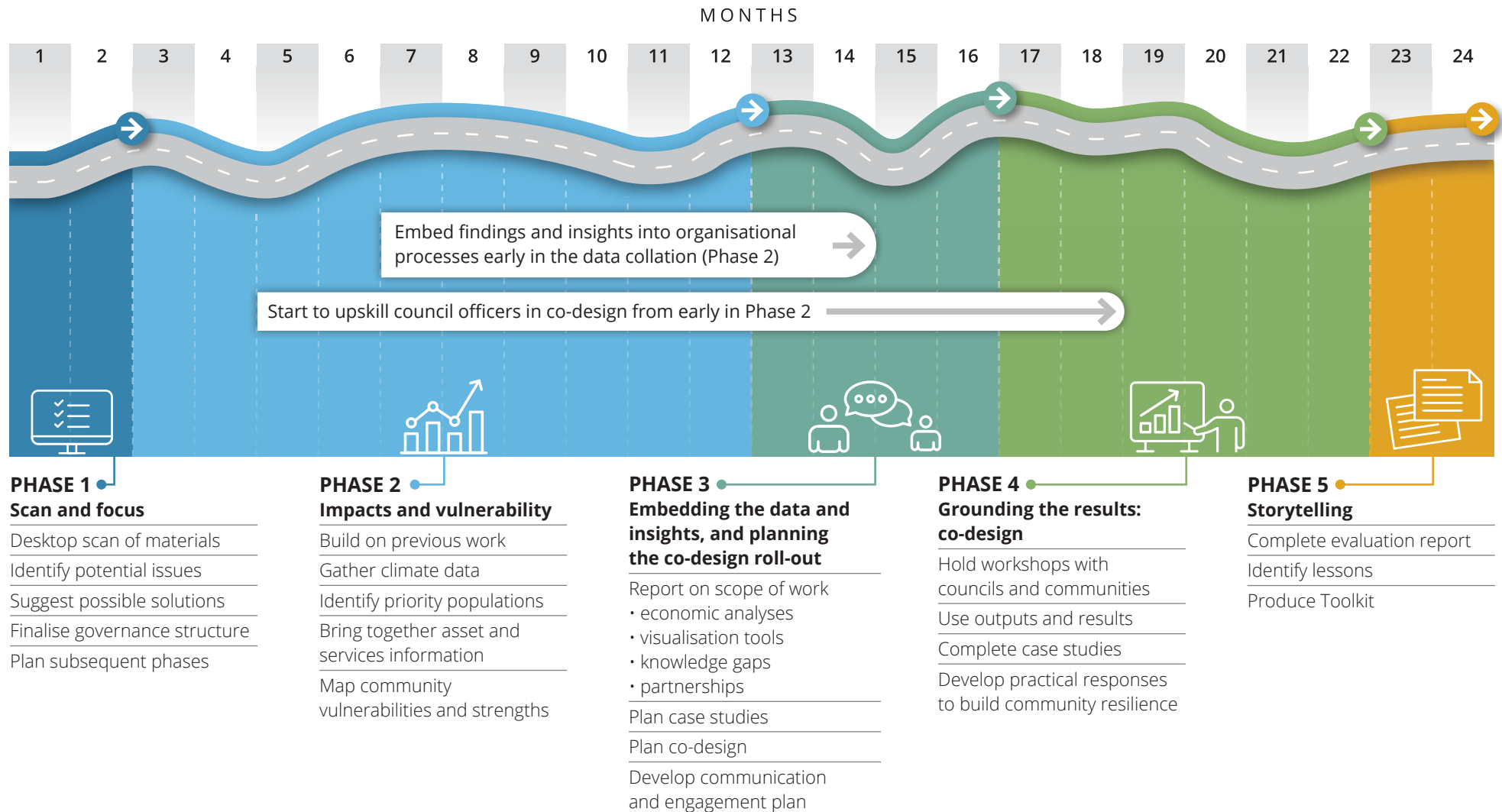
MONTHS

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |

Embed findings and insights into organisational processes early in the data collation (Phase 2)

Start to upskill council officers in co-design from early in Phase 2

PHASE 1
Scan and focus

Desktop scan of materials

Identify potential issues

Suggest possible solutions

Finalise governance structure

Plan subsequent phases

PHASE 2
Impacts and vulnerability

Build on previous work

Gather climate data

Identify priority populations

Bring together asset and services information

Map community vulnerabilities and strengths

PHASE 3
Embedding the data and insights, and planning the co-design roll-out

Report on scope of work
· economic analyses
· visualisation tools
· knowledge gaps
· partnerships

Plan case studies

Plan co-design

Develop communication and engagement plan

PHASE 4
Grounding the results: co-design

Hold workshops with councils and communities

Use outputs and results

Complete case studies

Develop practical responses to build community resilience

PHASE 5
Storytelling

Complete evaluation report

Identify lessons

Produce Toolkit

4 Introduction to this Toolkit

The objective of the Enhancing Communities Resilience (ECR) Toolkit is to document the innovative activities of the ECR project. The Toolkit presents the ECR project's outcomes and approaches as a practical guide for other councils and communities to apply in different regions across Australia at varying scales. It draws on interviews with key staff, meetings and workshops throughout the project, and collation of lessons learned.

While the ECR project will help prepare communities in Melbourne's South East Councils Climate Change Alliance (SECCCA) region for current and future changes to the climate, the purpose of this ECR Toolkit is to deliver a scalable and replicable approach for use by other jurisdictions. Scaling up these activities and applying them to other regions, potentially at a national level, will help build community resilience to climate change across Australia by improving community preparedness through practical actions, tools, and resources.

The Toolkit aims to help councils understand the problem to address, and clarify what councils need to do to plan and establish a similar project, how to collate and analyse data, when to inform and engage the community, and what risks and barriers to identify.

The contents provide information about the need for enhancing resilience, including an introduction to global and Australian climate change, projected changes in climate and related impacts, how changes are likely to vary across municipalities, and the importance of adapting to change. The Toolkit provides the international and local policy contexts, national, state, and local laws, and examples of other local government climate adaptation.

The Toolkit uses the ECR project as an example of enhancing community resilience, describing:

- a suggested governance model and project phases
- the resources and data inputs required for a successful project
- examples of project outputs, products and processes, including case studies and workshops with targeted community groups
- mentoring of council staff
- background information to the SECCCA and Minderoo Foundation frameworks that guided the project.

There is a summary of suggested communication and evaluation activities, a glossary to help achieve consistent language, as well as references and further reading.

The Toolkit includes recommendations and a checklist covering the steps required to progress through similar projects, with workbook notes pages to encourage council staff to consider the steps and lessons in the context of their regions and responsibilities.

The Toolkit includes functional guidance, as well as theory and background. The pages providing useful, practical advice are shaded yellow.

As this Toolkit aims to help upscale the processes to other regions around Australia, the audience for the Toolkit is primarily other local councils considering how to embark on this process. This audience owns the information required to complete such a project. The council audience includes councillors, CEOs and other decision-makers, staff with operational responsibilities, and others who need to consider long-term investment to address climate change.

The Toolkit will interest state governments interested in replicating the enhancement of community resilience at a larger scale. It is also a resource for potential funders of similar projects, such as the Minderoo Foundation, which supported this ECR project.

Secondary audiences for this Toolkit include potential partners or investors, including NGOs and community groups, who may be inspired to be involved in collaborative workshops or discuss the need and processes of such a project to encourage councils to follow this lead.

In summary, this Toolkit tells the ECR project's story, identifying the steps required to scale the project to other regions and inspiring others to enhance community resilience to climate change.

Notes

HOW WILL YOU USE THIS TOOLKIT?

> " Building community resilience was a central problem – the Toolkit helped us get started.

> " The Toolkit helped us to work through a step-by-step process, so my colleagues and I were on the same page.

5 Background

Enhancing community resilience

The ECR project aimed to help prepare communities in the SECCCA region for climate change impacts. It was funded by the Minderoo Foundation, a philanthropic organisation that seeks effective and scalable solutions to some of the world's most challenging problems.

Climate change is significantly increasing risks such as fires, floods, coastal erosion, and heatwaves to communities throughout Australia. Preparing communities for current and likely future changes to the climate is a critical task and requires the protection of life, property, and wellbeing. Proactively preparing communities to act before, during and after disasters builds community resilience to future impacts and reduces risks and consequences.

The ECR project provided council participants and communities access to new or improved information and services. It enabled them to develop tools and resources, make individual decisions, and apply practical actions to prepare for climate change.

Leveraging the outputs of the SECCCA Asset Vulnerability Assessment (AVA) project completed in 2021 (Spatial Vision, 2021), the ECR project assessed the vulnerability of the SECCCA region's community to climate change. The ECR project builds on the AVA project by identifying and visualising community sectors and services that are most vulnerable to the impacts of climate change. This is to raise awareness of adaptation needs and build resilience in vulnerable populations across the entire community, further to the AVA project's identification of vulnerable council assets. The ECR project focuses on who is vulnerable and why, and what can be done to make a difference to reduce vulnerability and build resilience.

Project consultants, SECCCA council members, and climate science experts identified and visualised the community services, demographics, locations, and communities exposed to climate change. Following this analysis, 4 case study solutions to climate change vulnerability were co-designed, delivered, and evaluated. The project also developed, delivered, and evaluated ways to build community resilience to climate risk by working with expert community development practitioners, councils, emergency services, and communities. Councils' community planners were integral in understanding vulnerability across communities, including in cohorts such as aged care, disability, Culturally and Linguistical Diverse (CALD) and youth.

Do you need to enhance community resilience?

About SECCCA

SECCCA is a network of 9 local councils located in the south-east of Melbourne (Figure 1). It is one of 7 Victorian Greenhouse Alliances that advocate, educate and deliver projects to reduce greenhouse gas emissions and build resilience to climate change. For a small organisation, SECCCA adds a lot of value. SECCCA supports communities, businesses and industries in the region to address, respond to, and adapt to the impacts of climate change. Member councils include the Shires of Bass Coast, Cardinia and Mornington Peninsula, and Cities of Bayside, Casey, Frankston, Greater Dandenong, Kingston, and Port Phillip. The network of councils collaborates with all levels of government to deliver regional climate change projects that benefit over 1 million residents (SECCCA, 2024a).
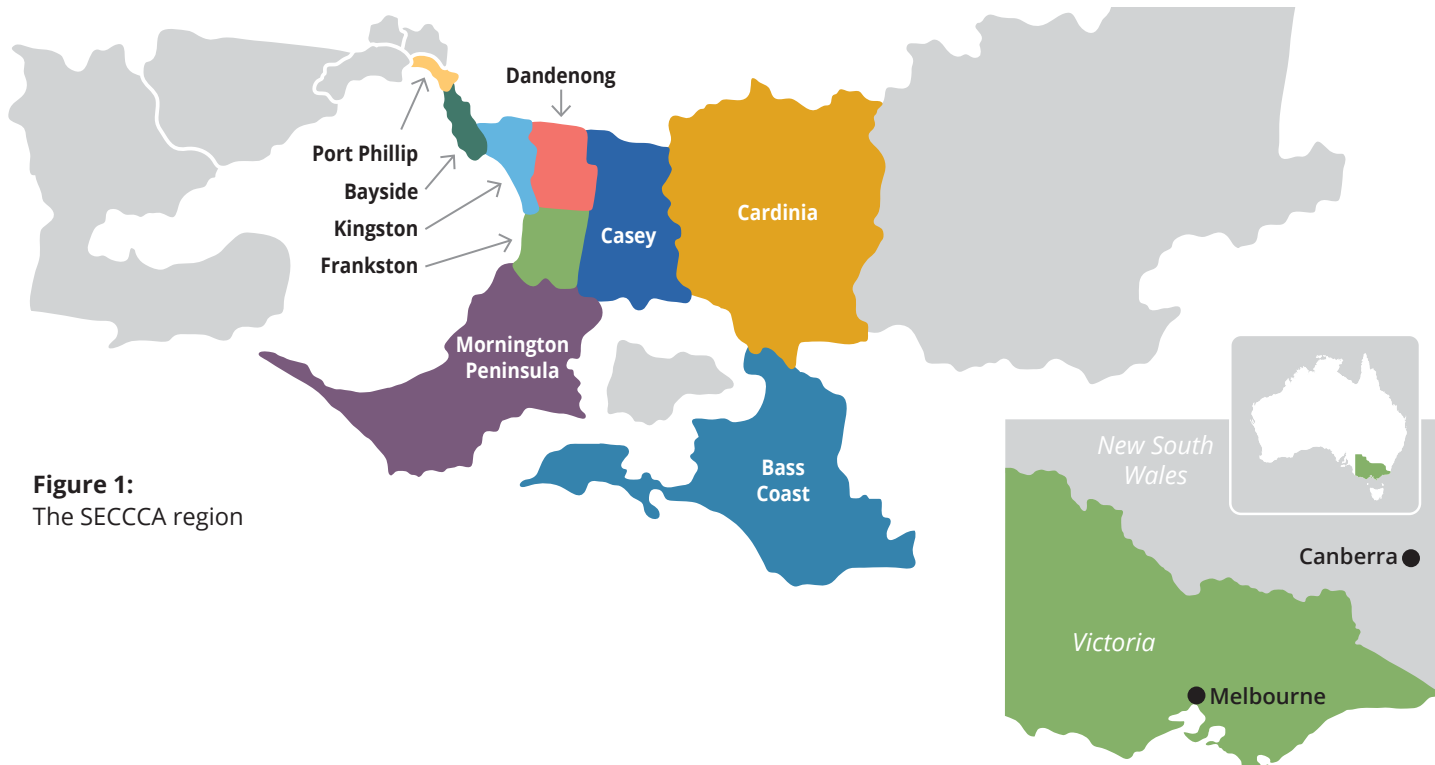
About Minderoo Foundation

The Minderoo Foundation is a philanthropic organisation that addresses persistent issues to drive global change (Minderoo Foundation, 2022). Andrew and Nicola Forrest established the independent, Australian organisation in 2001. It is one of Asia's largest philanthropies, with $2 billion committed to a range of global initiatives ranging from ocean research and ending slavery, to collaboration in cancer and community projects. The foundation supports early-stage innovation, develops major community programs, and advocates for systemic change domestically and internationally to improve the world for future generations.

Funding to SECCCA for this project came from the Minderoo Foundation's Fire and Flood Resilience Initiative, which aims to reduce the harm caused to communities. The initiative forms part of the Resilient Communities Mission, which works to reduce the scale and impact of fires, halve the hazard exposure to fire and flood in the landscape, and lift the resilience of Australia's 50 most vulnerable and exposed communities.

Can you identify potential funding sources?

Figure 1:
The SECCCA region

What is community resilience?

It is important to define words such as vulnerability and resilience, as these terms have specific meanings concerning community resilience to climate change. The definitions below were used in the AVA project (Spatial Vision, 2021) after a discussion focusing on communication and language, and draw significantly on IPCC (Solomon, 2007) definitions.

Vulnerability: The degree to which a system is susceptible to, or unable to cope with, shocks (hazards) and stressors (exposure). Vulnerability is a function of the character and magnitude of shocks and stressors to which a system is exposed, its sensitivity, and its ability to adapt.

Resilience: The ability of a system to deal with shocks and stressors, while retaining the same basic structure and function, the capacity for self-organisation, and the capacity to adapt to stress and change.

Climate resilience: The ability of a system to absorb and recover from climatic shocks and stressors, while positively adapting and transforming its structures and means for living in the face of long-term change and uncertainty.

The Minderoo Foundation similarly defines **community resilience** as the capacity of individuals, communities, institutions, and systems exposed to hazards to survive, adapt, and thrive in ways that improve outcomes in the next disaster event and improve community wellbeing more broadly (Minderoo Foundation, 2022).

Minderoo resilient communities framework

A climate resilience framework provides a way to consider relationships between aspects of resilience, the environment (including intensity of extreme weather events, and climate change impacts) and systems (including social, ecological, economic, physical, and institutional components).

The Minderoo Foundation developed a Resilient Communities Framework to provide communities, NGOs, governments, and others with a way to plan and act to build resilience to climate change and other challenges (Minderoo Foundation, 2022). The Resilient Communities Framework supports a systemic and whole-of-society approach to understanding and building community-level disaster resilience. The framework uses knowledge, values Indigenous ways of building community, acknowledges Australia's complex history, and engages with communities directly to increase their strengths and capacities to face future shocks.

Its principles guide how to approach activities to increase community resilience, including having the community lead and own the process, understanding risk and looking to the future, ensuring inclusive, broad and equitable engagement, aligning actions to enable integration and coordination, and being accountable. These principles align well with the governance and approach of SECCCA's ECR project.

The framework also provides an overview of the overlapping community environments that can enhance or diminish a community's resilience. These include the social, cultural, economic, natural, built and health and safety interconnected systems and assets.

It provides accessible tools (an assessment and prioritisation tool, and an initiative enhancement tool) for resilience practitioners, community leaders, policymakers and funders to help build resilience. The tools can be used to guide a large-scale regional vulnerability assessment project, or to guide the evaluation of smaller projects to provide a sense-check and reflection on impact in a systematic way.

SECCCA vulnerability assessment framework

SECCCA's ECR project framework to assess vulnerability is strongly aligned with the Minderoo Foundation's Resilient Communities Framework, following its approaches for engagement and co-design.

As background, the Intergovernmental Panel on Climate Change (IPCC) (Solomon *et al*., 2007) developed approaches to vulnerability assessment. These methods describe how to assess the likely impacts and vulnerability of assets and systems using information on their exposure to climate change, as well as their sensitivity and adaptive capacity. These vulnerability assessment approaches are based on relationships between biophysical components (such as the impact of climate change), the effects of human activity, adaptation and mitigation activities, exposure, sensitivity, adaptive capacity and vulnerability. The approaches generate an impact rating, adaptive capacity and asset vulnerability assessment.

Drawing on the IPCC's approaches, SECCCA's first-pass AVA (Spatial Vision, 2021) used individual asset characteristics to estimate an asset's sensitivity to particular climate

change variables, and features of the asset affecting its ability to adapt. This method developed climate scenarios and an impact rating, and estimated the sensitivity and adaptive capacity of assets to climate change to assess their vulnerabilities.

The 2023 ECR project built on the 2021 AVA framework to incorporate consideration of risk. Risk considerations should not

only include climate change, but also exposure and vulnerability from non-climatic factors.

Figure 2 summarises how the framework can separate the hazard (threat) from the exposure (event). Hence the hazard informs the likely vulnerability of an asset based on its sensitivity and capacity to respond. The potential impact or risk therefore results from the

combination of the vulnerability of an asset or system and the actual exposure it experiences in terms of severity, duration, and spatial extent.

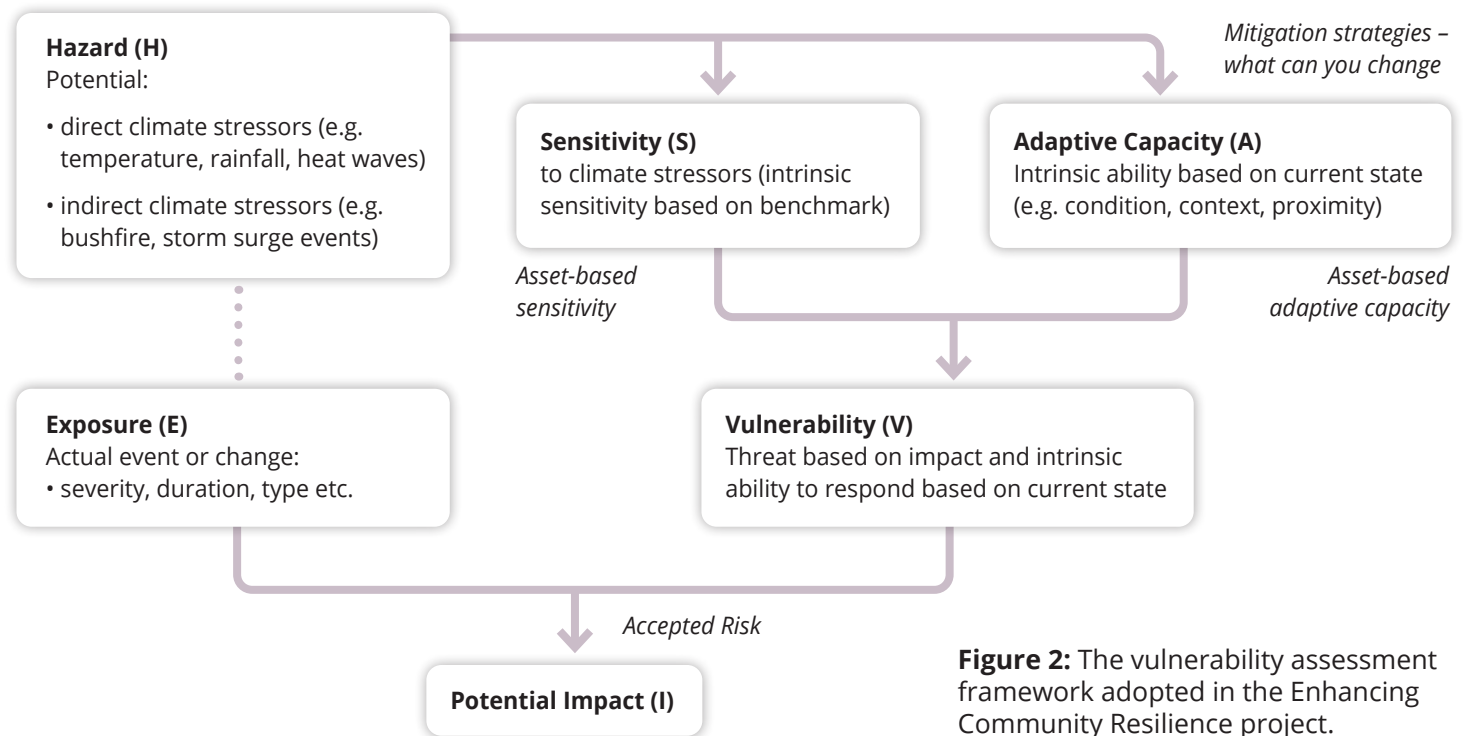> ✓ **Can you apply a vulnerability assessment framework to your project?**

Figure 2: The vulnerability assessment framework adopted in the Enhancing Community Resilience project.

Project tasks

The main tasks of the ECR project were to:

1. undertake research to identify the community groups within the SECCCA region that are vulnerable to climate change, and the assets and services that support the groups

2. undertake research nationally and globally to identify best practice projects and programs that have enhanced community resilience to climate change

3. develop and adopt a methodology that enables councils to assess the community impacts of climate change and develop appropriate responses

4. create a platform (using ClimateViewer and QGIS software) to enable up-to-date climate modelling to be applied across the SECCCA region, and ongoing assessment of climate impact on community assets and services

5. establish a spatial representation of how climate change will affect communities and council assets and services that provide services to the community

6. demonstrate how community resilience to climate change can be strengthened

7. develop and implement a community engagement strategy, that informs and enables the community to understand, plan and act to build resilience to climate change

8. undertake research and develop recommendations for visualisation tools that can be used in scenario and response planning and adaptation option analysis

9. co-design and undertake workshops and other activities with the community to trial and deliver place-based priority case studies to improve community resilience.

The project covers the stages involved with climate disasters and climate events that require different types of responses from support agencies:

Before a climate disaster or event

The project developed an understanding of the critical physical community assets that provide services, the services themselves, social capital operating within communities, the level of risk and vulnerability to climate disasters and events, and the resources and plans required to build resilience and how these vary between different demographics.

The project provided intelligence to inform where community support services are placed in times of climate disasters and climate events and it also consulted with the community and community planners to improve preparedness.

During and after climate disaster or event

The project developed an understanding of shared assets (built and social) and services that may be affected during and after climate disasters and climate events. By providing emergency services and councils' emergency managers with capabilities to identify and protect assets and services quickly and easily, the project provides situational awareness to enable effective delivery of community and emergency services in times of disaster.

After emergency events, councils and other agencies provide support services to affected communities including food, clothing, shelter and mental health services. As the frequency and extremes of events change, a reassessment of resourcing and the preparedness of support services and systems is needed.

Co-design with councils' emergency managers, and relevant authorities and stakeholders, refined the project scope and identified gaps for future consideration.

The 5 phases

The ECR project was delivered in 5 distinct, yet connected, phases (see Figure 3).

Phase 1: Scan and focus

A desktop scan of materials clarified the working environment, identifying potential issues and suggesting possible solutions. This phase brought together a group of key stakeholders to finalise the project's governance and plan for the subsequent phases.

Phase 2: Impacts and vulnerability

The second phase built on the SECCCA Asset Vulnerability Assessment (Spatial Vision, 2021). It brought together data on the latest climate information, and on priority populations and their vulnerabilities and strengths.

Phase 3: Planning the roll-out

This phase developed a report detailing the scope of the work (including economic analyses, required visualisation tools, identifying knowledge gaps, partnerships, and planning case studies and co-design), and a communication and engagement plan.

Phase 4: Grounding the results

This step used outputs from earlier phases in workshops with councils and communities to develop practical responses that build resilience within communities vulnerable to climate impacts (Spatial Vision, 2023b). These case studies helped councils build resilience to climate change challenges in vulnerable communities.

Phase 5: Storytelling

This phase involved developing this Toolkit, and the evaluation report, to fully describe the project and identify lessons for use by other councils and communities aiming to build resilience in their areas.
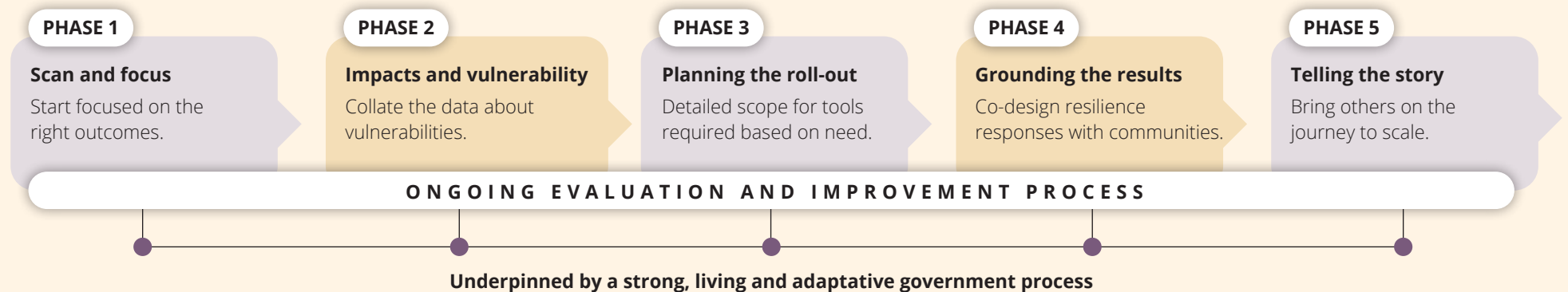
PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5
Scan and focus Start focused on the right outcomes.	**Impacts and vulnerability** Collate the data about vulnerabilities.	**Planning the roll-out** Detailed scope for tools required based on need.	**Grounding the results** Co-design resilience responses with communities.	**Telling the story** Bring others on the journey to scale.

ONGOING EVALUATION AND IMPROVEMENT PROCESS

Underpinned by a strong, living and adaptive government process

Figure 3. Summary of the 5 phases of the project

Barriers

Several barriers and challenges were identified throughout the ECR project. The solutions developed to overcome these may be useful for other councils embarking on a similar project.

Capacity/time and budget/resourcing constraints

The success of such a project can be limited by staff capacity. A good way to address this is by aligning project data with council business plans (see 'Focus on policy-relevant information' below) to ensure resources support achieving the project goals.

Council staff with an interest in the project became involved in the ECR, but then these staff tended to carry responsibility, with others expecting them to be the expert and a supplier of data. To address this, councils could identify super-users across multiple council teams and resource positions accordingly. The description of what involvement in (or leadership of) the project means, with practical examples of resources required (including the scope, funding, and time commitments) is needed to enable councils to understand better what it means to commit to being involved.

Managing your capacity can be a challenge, so staff involved in a project like this should embed it into their workload, and ensure it is added to their delivery goals, projects or work plans.

Establishing an internal community of practice, for example around data, is a good way to learn what other data council staff have access to. Discussions within a community of practice can identify the connection from the tool to the real world, identify links to council staff jobs, and help determine the issues the council is trying to solve.

Difficulty engaging management and colleagues

Engaging management and getting visibility of work within the council can be challenging. To address this, management needs to be briefed on the project in a way that shows it runs across departments and solves issues relating to council planning and strategy. Show that the project can be incorporated into other work and planning (such as climate change responses, and budgeting). Provide background and normalise the information by showing that the data can support a council priority such as adaptation action planning. Tell a

story about the results with a real-world example, using simple diagrams, case studies, and local factoids.

To involve other staff, hold internal briefing sessions. Link the data and findings to their projects – show practical use of the findings. Watch project videos together as a workshop (with catering!) rather than asking staff to watch online videos.

Staff changeover

Staff changeover can be a barrier to success. Ensure that details of the project are incorporated into business plans so councils need to act on the project and see it through to completion. In addition, the reports and data should be visible in internal systems, and an internal guide should be produced on how to use them.

Timeliness of data

The project relies on publicly available knowledge and data. The population datasets incorporated into the vulnerability assessment were based on census data, so they represent a point in time. These won't be updated until population data are updated following the 2026 census. The limitations of the data need to be disclosed to managers and users so they understand that planning and

financial decisions are based on the best available information. Clarify that data can be outdated and require adjustment in the future, and whether there is an opportunity to update the input data at particular dates.

Understanding the data

Comprehending large volumes of data and results can be a challenge. It is essential at the outset to determine the question you want answered. Read the background reports. Analyse the spreadsheets – although maps are easier to visualise than spreadsheets.

Use case studies and stories to illustrate how the data can be used, rather than just presenting the data. Set expectations of what the data can do when applied to the real world.

Be realistic about what you can do in one sitting, or alone. You don't need to be a master of everything – bring your colleagues on the journey with you to share the load, aligning tasks with their skills such as data, QGIS, or understanding reports.

> ✓ **Do you have a project plan identifying potential barriers and risks to undertaking your project?**

6 Project needs

Project resources

The funding for such a significant undertaking should not be underestimated and can be in the order of $1 million.

For example, the SECCCA ECR involved the following costs:

- project management, community engagement, contract administration, contribution to salaries for Executive Officer and Projects Coordinator: $300,000

- project inception and scope refinement, assessment (initial, detailed, and refined) of community impacts and resilience, mentoring of LGA staff and other stakeholders: $315,000

- desktop analysis, project evaluation, Toolkit development, communication and engagement planning: $130,000

- co-design engagement activities, solutions workshops and associated activities: $220,000

In addition, there were workshop logistics, venue, catering, and so on contributed by councils. Most governance and project meetings and many workshops were held online. Travel was local, so it was not a project cost.

Adaptive governance

The governance structure is represented in Figure 4.

SECCCA was the project lead and managed the administration, including appointing a project manager and coordinating member councils and stakeholders. The SECCCA Management Committee, consisting of 2 elected members from each member council, provided overall project oversight and met every 6 weeks for project progress updates.

A Project Control Group (PCG) comprised interested SECCCA Project Subcommittee members and council community planners and officers. It met every 6 weeks for project updates and decisions as required to ensure the project was delivered. Any unresolvable issues in the project were referred to the PCG for resolution.

Each quarter, the PCG Chair met with SECCCA, the Minderoo Foundation project lead, and the project evaluator (the Project Sponsor Group) to ensure the project was on track to deliver the desired outcomes identified in Phase 1.

A Project Working Group (PWC), which included a representative from each council's assets team, helped coordinate the project internally. The PWC liaised with SECCCA and the consultants, and met as needed.

A Technical Reference Group (TRG), which provided expert advice to inform the project methodology and development, met several times throughout the project. The TRG included a range of expertise including health, emergency management, asset management and wellbeing.

The Project Communications Group participated throughout, mainly contributing to the Communication and Engagement Plan early in the project. This group included internal and external stakeholders and had a national focus.

Several project consultants supported the delivery of the project, including Spatial Vision, Science into Action, Scientell, and Authentic Co-design.

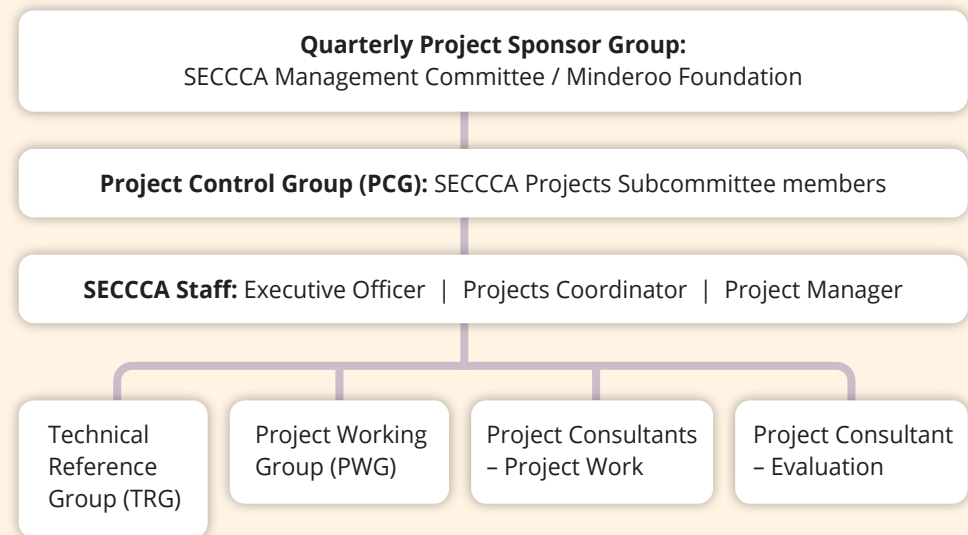> ✅ **Can you identify staff and stakeholders to govern your project?**

Figure 4. Project governance structure

A consistent language

Early in the AVA project (Spatial Vision, 2021), language was identified as a barrier to having readable and useable project outputs. The project developed principles for communicating technical terms, determined language use, and developed a glossary. The ERG project built on this by clarifying the meanings of key words and concepts, due to the technical expertise of those involved in the project and the project's complexity and technical nature.

The ERG project adopted definitions that provide a shared understanding of how the project defines and measures concepts related to weather and climate change, vulnerability and resilience, and assets and community types (see Appendix: Abbreviations and glossary).

Stakeholders in climate change science, council social planning, spatial data management, engagement co-design and other areas associated with such a project use different terms for the same concept, or the same word for vastly different concepts.

For example, vulnerability can mean one thing in plain English, but has a specific meaning in the context of climate change vulnerability. Similarly, resilience is used very differently in different disciplines. From a climate change perspective, resilience relates to the social, ecological, economic, physical, and institutional dimensions of a social-ecological system, on levels from households, to communities, to whole countries, and how these systems can deal with changes. It includes the ability to respond to known, as well as projected, threats, and also considers innovation, learning and anticipation to be prepared for the projected impacts of a changing climate.

Establishing agreed communication approaches and consistent language in vulnerability assessment projects will help ensure clear communication with the non-technical users of project results and outputs.

Focus on policy-relevant information

There is a need to turn the rich information and depth of data into useful and clear knowledge for decisions. In designing the project logic, it was important to ensure that the information derived was in a form that council decision-makers could use. The first questions from council leadership are, 'What is this?' and 'Why is it needed?'. So, communication resources (for example, PowerPoint slides) and other documents (for example, a summary project-on-a-page) are required for executive teams, and to give non-experts confidence in the method and data, with clear links to local information.

Connections between the ECR project and council strategy were achieved by ensuring alignment between project phases and council activities, including the declaration of a climate emergency, council legislation, planning activities, and so on. For example:

- the project helps a council take immediate action to protect and prepare for the serious risk that climate change poses, and to secure a liveable, resilient and healthy future for the community, which aligns with the council policies related to climate emergency and preparedness

- strategic priorities relating to improving mental wellbeing are supported by the project's stimulation of conversations and awareness of climate change within the community, and its outcomes that support the community to be resilient and respond to climate emergencies

- fire management and similar plans are supported by providing information to inform policy, planning and decision-making, and encouraging innovation to develop local solutions

- the project's long-term focus on making infrastructure, water management, and natural spaces resilient to the impacts of climate change supports council strategies

- Phase 4 of the project underpins council strategies to develop and implement training for staff awareness and response to the climate emergency.

> **Have you identified strategies and business units within your organisation that can use the results from this project?**

Mentoring

Mentoring council staff in the use of project data and outputs was an important way to ensure the councils took up and used the results of the ECR project. As one council participant stated during the evaluation of the project, 'The data is excellent, we just need the capacity and knowledge to use it'.

Project participants wanted to learn about the data for their area, how to use it to identify vulnerabilities, how to identify key risks for the council, how to use the tool supplied to visualise the data, and data limitations. This was achieved by data consultants offering online or in-person mentoring to 2 or 3 representatives (champions) from a range of areas, such as health and wellbeing teams, strategic planners, community resilience teams, communication and engagement teams, social planners, research and data analytics advisers, the climate change teams, environmental planners, emergency management, and GIS teams. While the names of the teams or groups might differ across Councils, most of the roles are clear from the above titles, and there was consistency across council responses.

Almost all councils wanted to focus on working through, in a very practical way, the vulnerability assessment of communities in their municipality to understand the tool's power. In addition to learning from project consultants, participants wanted to learn from colleagues in other councils about how they use the data, tools, and findings.

Mentoring led to tangible outcomes, including an understanding of how to use the tool in relevant areas across councils, an ability to start working with internal and external stakeholders on the findings, an examination of the data to identify areas of higher vulnerability (and hence community resilience opportunities), a prioritisation of next steps, and learning from each other about how to influence behaviour across councils to promote climate change adaptation and resilience.

> **How will you engage your council colleagues about using the project's output data tools?**

Notes

What do you need for your project?

> For longer-term projects, be prepared for staff turnover. Make sure comprehensive handovers help keep the project moving.

> Hold internal learning sessions. Link the data and findings to the projects of your colleagues. Create super-users across a couple of different teams.

> Identify early enthusiastic champions of the work.

7 Climate change background

Photo: Bayside City Council

Global climate change

The global atmospheric carbon dioxide concentration was 421 parts per million (ppm) in 2023 (UK Met Office, 2024). This is much higher than the natural range of 172 to 300 ppm that existed for thousands of years prior to the Industrial Revolution, and is the highest level on Earth in at least 2 million years (CSIRO and Bureau of Meteorology, 2022).

The Earth has warmed by 1.4 °C since the Industrial Revolution (NOAA, 2024). 2023 was the planet's warmest year on record, followed by 2016, 2019 and 2020. Each of the past 10 years is in the top 10 warmest years since 1850. There is no record of temperature increasing this rapidly, with recent warming occurring about 10 times faster than warming at the end of an ice age (CSIRO, 2023a).

There also have been changes to the intensity and frequency of extreme weather events. Increasing greenhouse gases have been the main cause of recent changes to the world's climate.

Australian climate change

Australia has warmed by around 1.5 °C since 1910, when national records began (CSIRO and Bureau of Meteorology, 2022). Australia's warmest year on record was 2019, followed by 2013, 2005, and 2020 (Bureau of Meteorology, 2024). Nine of Australia's top 10 warmest years have occurred in the past decade.

Australia's climate is drier than in previous decades, with average rainfall declining since the 1950s, mainly in the south-west and south-east, and especially from April to October (CSIRO, 2023b).

Global sea levels have risen by around 25 cm in the past century. The rates of sea-level rise around the north and south-east coasts of Australia have been much higher than the global average over the past 30 years (CSIRO, 2023c).

Projected changes in climate

The latest IPCC report states that the most likely (in light of existing emissions and reduction policies) global warming by the end of the century will be around 1.5 to 3 °C, with a worst-case warming of 5 °C (Lee et al., 2024).

Australia is warming faster than the global average, so could warm by between 0.4 and 6.8 °C (relative to 1986-2005) by 2100 (CSIRO, 2023d). This means that while the past decade is Australia's warmest on record, by 2100 it will probably be the coolest decade of the century.

Under a changing climate, Australia can expect more extreme weather (CSIRO, 2023d), including:

- more frequent and more extreme intense short-duration heavy rainfall
- more frequent and more intense droughts that last for longer
- an increase in fire-weather risk, longer fire seasons, and bushfires across larger areas
- an increase in the proportion of intense tropical cyclones
- extreme sea levels.

Large-scale climate drivers, such as the El Niño – Southern Oscillation and Indian Ocean Dipole, will cause high variability from year to year, so cooler and wet years will still occur.

Impacts of climate change

Climate change will continue to significantly impact marine life, habitats, ecosystems, landforms, culture, human health and infrastructure, with flow-on effects on society and the economy.

For example, high temperatures and flooding can damage buildings and infrastructure. Impacts of sea-level rise are likely to include more frequent and extensive inundation of low-lying areas, and erosion of cliffs, beaches and foreshores.

There is likely to be declines or extinctions of animals and plants, a rise in heat-related deaths, areas suited to agriculture are likely to change, energy demand will increase, and snow cover will decline. These changes will cause problems for disaster risk management, supply of water and food, transport and energy systems, human health, tourism, and national security (CSIRO, 2023e).

The impacts of climate do not always occur gradually. Rather than being linear and predictable, tipping points to the climate system can be a surprise, even leading to irreversible climate change.

Changes vary across municipalities

Climate hazards will change differently around Australia, and these hazards will vary under different warming levels. All regions around Australia are susceptible to heat extremes, extreme rain and flooding, with heat and flooding being a particular risk in the built environment.

Many municipalities are densely populated. Projected increases in residential population lead to high-density housing. Without good planning, increased density can reduce vegetation cover, trap more heat, increase stormwater runoff and increase demand on parks and beaches (City of Port Phillip, 2024). These areas may be more susceptible to heat impacts without adaptation occurring.

A report ranking regions worldwide based on risk to the built environment from climate change, including flooding, fires and sea-level rise, found that Victoria, New South Wales and Queensland rank among the places most at risk from physical climate change, particularly in heavily populated areas. Rural and regional areas are also particularly vulnerable (XDI, 2023).

Adapting to change

Climate adaptation, or 'climate-proofing', can reduce the risks of damage and other negative impacts of climate change, and take advantage of any opportunities. Assessing and prioritising vulnerable communities, sectors and regions provides information to help plan strategic, long-term adaptation decisions. Adaptation can be incremental, to maintain a system or process, or transformational, to change the fundamental attributes of a system.

Barriers to adaptation include a lack of local climate information, limited integration of different levels of governance, and different attitudes towards risk management (CSIRO, 2023f). The success of adaptation decreases with increasing global warming, so we need to adapt to climate change in parallel with mitigation efforts to reduce greenhouse gases.

Do you have information about climate change and its likely impacts on your region?

Notes

What are the climate change considerations in your region?

> *Start with one climate scenario or model. There is so much data it can overwhelm; we started with ACCESS 1.0, RCP 8.5, 2050, and that got us going.*

8 Climate change policy contexts

National, state, and local laws

The need to assess vulnerability and enhance community resilience to climate change is highlighted in local, state, national and international policy. There is also increasing community awareness of climate change impacts, leading to greater expectations of council leadership of climate change action. Over 100 local government areas in Australia have declared a climate emergency, and more than 2,300 jurisdictions worldwide have made climate emergency declarations (City of Port Phillip, 2024).

Responsibility for making climate change risk and adaptation decisions in Australia is complex for federal, state, and local governments. Regarding legal principles relating to risk and liability management (DELWP, 2020):

- statutory authorities, including local government, have a duty of care in exercising their functions and powers to manage foreseeable risks

- climate change hazards and risks are significant and foreseeable, so decision-makers are accountable for considering these matters in making a decision as part of exercising their duty of care (see International Sustainability Standards Board section below)

- sound decisions are enabled by acting as a reasonable person in making decisions guided by law.

All councils must comply with legislation and policy, which is constantly under review and subject to change. The Victorian and Australian Governments are strengthening climate change policies, with more ambitious greenhouse gas emission reduction targets (City of Port Phillip, 2024).

For example, in Victoria, the Local Government Act 2020 includes an increased legislative requirement for councils to factor climate change into planning and decision-making, noting that the role of a council is to govern for the benefit and wellbeing of their community.

As well as legislating a long-term target for Victoria to achieve net-zero greenhouse gas emissions, the Climate Change Act 2017 provides Victoria with a legislative foundation to manage climate change risks and maximise any opportunities for a climate-resilient community and economy (DELWP, 2020). In addition, Victoria's Public Health and Wellbeing Act 2008 requires councils to prepare a 4-year municipal health and wellbeing plan after each council election, which must consider climate change impacts. Although not referring to climate change, Victoria's Planning and Environment Act 1987 protects long-term public interests in the use, development, and protection of land in Victoria. Its planning objectives include relevance to sustainable land use and development, protection of biodiversity and natural resources, maintenance of ecological processes, and responses to bushfire, flood, and heat.

Have you considered relevant local and other laws and policies that could influence your project approach?

International Sustainability Standards Board

Councils have a duty of care regarding climate change adaptation. With the threat of climate change now clear and described in local, state, national and international agreements and legislation, a court would likely conclude that the risks and impacts of climate change are reasonably clearly foreseeable. Hence, negligence claims may arise in various circumstances (DELWP, 2020).

In 2015, the Financial Stability Board, an international body that monitors and makes recommendations about the global financial system, launched the Task Force on Climate-related Financial Disclosures (TCFD). The TCFD (TCFD, 2017) developed voluntary recommended disclosures that companies could use when providing information to investors, lenders and insurance underwriters about the climate-related financial risks that companies face. The TCFD encouraged organisations to evaluate and disclose the climate-related risks and opportunities relevant to their operations as part of their annual reporting.

In 2021, the International Sustainability Standards Board (ISSB) proposed a new global disclosure standard, based on the TCFD. The ISSB is developing standards to produce a high-quality, comprehensive global baseline of sustainability disclosures. With standards evolving, councils must monitor how this will influence local government responses and state government directions on how to respond. Auditors will ask councils how climate-related risk has been considered, whether the risk is material and what disclosures have been made.

To be consistent with the ISSB and TCFD recommendations, future disclosure requirements, and the local, state and national policy, planning and regulatory environment, councils will need to draw on information from activities such as an asset vulnerability assessment and enhanced community resilience planning to identify and report on climate risks to assets and the community.
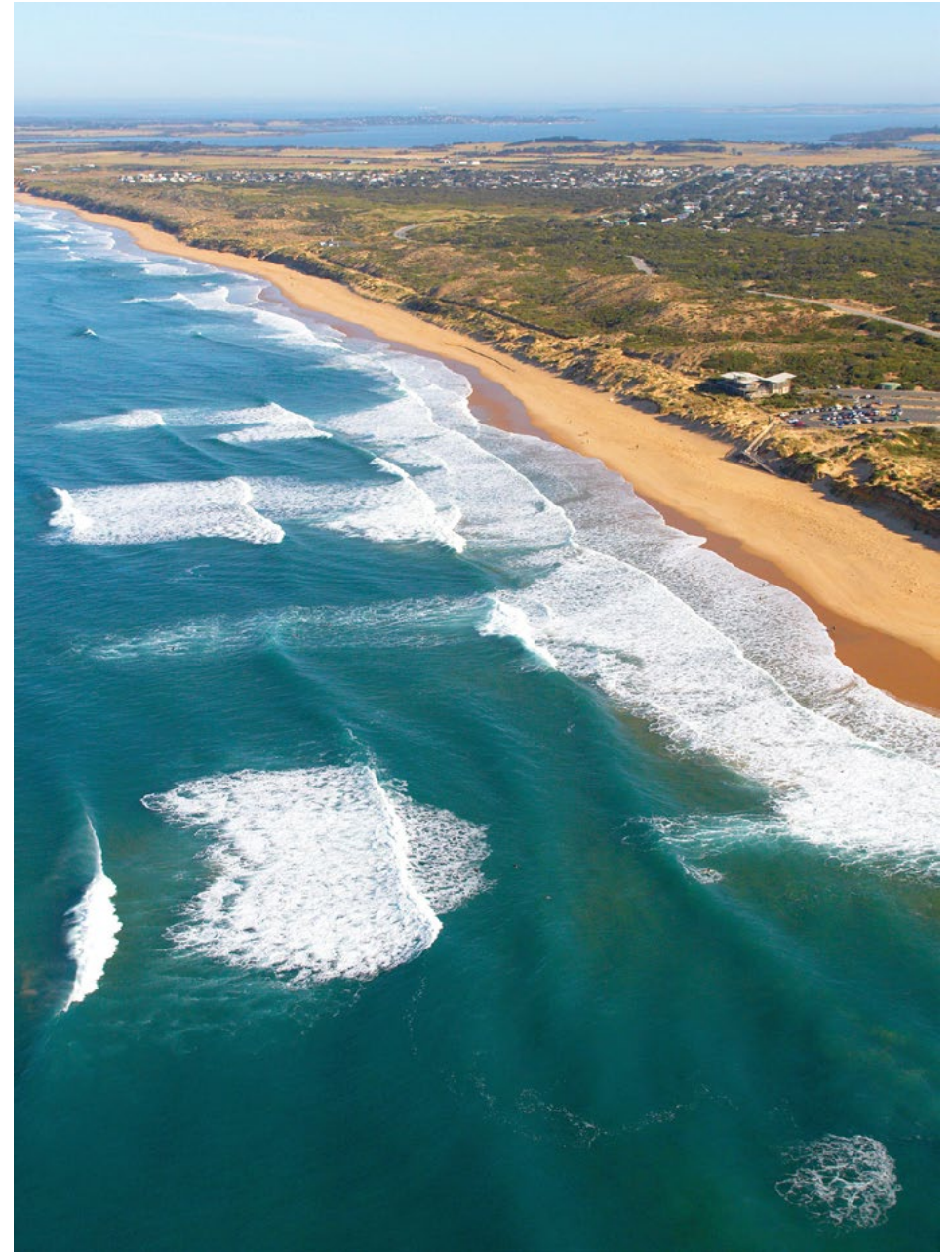
Local government climate adaptation examples

As mentioned above, SECCCA completed an Asset Vulnerability Assessment project that developed tools and approaches to support councils in understanding how council buildings, drainage and local road assets will be affected by climate change (Spatial Vision, 2021). The project examined how climate change affects expenditure on council assets by calculating the financial and economic costs of various adaptation options. The project included the development of a Climate Vulnerability Guide to build capacity and help councils take similar approaches.

In addition, the project provided information to businesses that showed their exposure to climate extremes and how they can respond to improve resilience. Small to medium enterprises are vulnerable to the impacts of climate change in many ways, but have varying levels of preparedness, with little prioritising of climate change impacts. This project developed resources for the businesses to help them conduct climate risk assessment, mitigation and planning. The process aimed

to help them understand and plan for climate change. Other SECCCA projects have examined financial risk and budgeting for climate adaptation, risks to infrastructure in coastal areas, and engaging vulnerable communities in practical adaptation responses (SECCCA, 2024b).

The Western Alliance for Greenhouse Action (WAGA), a partnership of 7 councils west of Melbourne, developed an adaptive capacity checklist to give councils a quick snapshot of their adaptive capacity. In 2018–21, RMIT and WAGA in conjunction with local councils coordinated the preparation of the checklist, part of the 'How well are we adapting' website (WAGA, 2024). The checklist includes tools to measure local government adaptation to climate change as a first step to understanding their organisational strengths and opportunities and how they can use these to maximise their ability to adapt and increase resilience.

The Northern Alliance for Greenhouse Action (NAGA), a network of 9 councils in Melbourne's north, has several projects that aim to protect

the community from the impacts of climate change. For example, the Costs and Benefits of Climate Change Adaptation Options for Community Assets project determined the most beneficial adaptation options for communities. NAGA conducted a regional vulnerability assessment to identify populations, infrastructure and assets at risk from climate change in the north of Melbourne (NAGA, 2024).

The Eastern Alliance for Greenhouse Action (EAGA), a collaboration of 8 councils in Melbourne's east, have worked on regional programs that facilitate adaptation. These include a Climate Change Adaptation Roadmap to guide adaptation projects and initiatives across the region, a project to develop an understanding of the costs and benefits of different adaptation options for community assets and infrastructure, and information on the costs of climate impacts and adaptation measures relating to public and private assets and infrastructure (EAGA, 2024).

Have you researched other councils' activities to avoid 're-inventing the wheel'?

Notes

What policies and contexts do you need to consider?

> Build on existing work within your organisation. There is likely much happening in this space already.

> Don't try and reinvent. Use existing help.

9 Project inputs

The ECR project used the latest available data, updated in 2023–24. The sources of climate, population, and asset data used in the project are summarised below.

It is important to understand the breadth of information available to projects investigating a community's resilience to climate change, including data on climate hazards, types of populations, and the assets and services that support communities.

Data availability can quickly evolve, so it is important to investigate new sources of information. For example, in Victoria, new data such as the Victorian Coastal Hazard Assessment, and Melbourne Water flood level data, have recently become available and could augment the information described below.

It is also important to supplement national and state government data sources, such as Census information and climate projections, with relevant local knowledge and insights.

Climate, population, and asset data

Climate information

Councils identified several types of relevant climate information (Spatial Vision, 2023a):

- flooding extent and depth due to severe storm cells or prolonged high rainfall

- extreme heat related to summer maximum temperatures or heatwaves

- extreme fire risk related to greater frequency of fire weather, dry periods and hot spells

- increased frequency and severity of coastal inundation related to sea-level rise and coastal storm surges.

The project drew climate data from a range of sources. For example, temperature and rainfall observations and projections, including extremes, as well as general wind data, were obtained from CSIRO and the Victorian Government's Climate Projections 2019 (CSIRO, 2019). Evaluation of likely changes in climate by 2030, 2050, 2070 and 2090, under representative concentration pathway (RCP) emissions scenarios of 4.5 and 8.5 informed trends of rainfall, daily maximum temperatures, and other weather variables across the SECCCA region. In addition, climate observation data and historical decadal information identified how some climate variables are already changing. Broader environmental resilience information, such as tree cover and heat vulnerability, was obtained from Planning Victoria.

Inundation data includes modelled flood extent data, which identifies the likely area flooded in, for example, a 1-in-100-year event or 1 per cent annual exceedance probability (AEP). The Insurance Council of Australia (ICA) national flood information database (NFID) contains information about the depth of floods on private property, and related insurance considerations. Inundation data applied to this project came from state government, water authorities and councils. For example, the Melbourne Water and the Coastal Inundation Database supplied local flood information.

Fire risk was determined from variables including dryness, rainfall trends and temperature increases, bushfire management overlays, and fuel load information. Information on sea level came from the Victorian coastal inundation dataset from the Department of Energy, Environment and Climate Action (DEECA).

Can you obtain the required different types and geographic coverage of localised climate data?

Vulnerable population information

SECCCA councils identified the following 9 populations, with subsets within these (so a total of 17 groups), in the community particularly vulnerable to anticipated climate change impacts and events (Spatial Vision, 2023d):

- older people (above 55, 65 and 85 years old)
- Non-English speaking background (NESB) – established communities
- NESB – recent arrivals (past 5 years, past year, and those on bridging visas)
- single mothers
- people experiencing homeless or insecure housing
- individuals with a disability or high level of care
- youth (aged between 15–19 and 20–24)
- low income
- First Nations (above 55 and 65, and those with a disability or high level of care).

Data about these vulnerable sub-populations, including older people (such as those older than 65 and older than 85), First Nations People requiring care, young people, people experiencing homelessness, non-English speaking backgrounds, and health information were obtained from sources including the 2021 Census data, Services Australia, Vicmap, Geoscience Australia and Planning Victoria.

These sub-populations were considered in the context of changes in exposure to extreme weather and climate (based on climate information, above) and their capacity to respond to emergencies (community assets that provide a service to communities, below) to identify the sensitives that may make people vulnerable and the impact under different climate change scenarios.

✓

Can you obtain the required types and geographic coverage of community demographic data?

Services and assets information

The numbers of community services and assets that help communities were determined at 3 geographic scales: Local Government Area (LGA), suburb, and Statistical Areas Level 1 (SA1), which are the smallest geographical areas considered by the Australian Bureau of Statistics Census data. SA1s have a population of between 200 and 800 people, and there are 57,523 SA1 regions covering Australia (Bureau of Statistics, 2024).

Information about capacity to respond to emergencies came from a range of sources. For example, self-sufficiency measures were obtained from public transport information, proximity of services such as doctors and pharmacies, and 2021 Census data about car ownership, time at current address, and education.

Social support network information, including aged-care and child-care facilities, libraries, and places of worship, came from Vicmap and street maps. The feeling of trust and tolerance, implying social connectedness, was obtained from the Victorian Population Health Survey 2020. Vicmap planning zone information helped understand land-use categories, such as residential, commercial, parks, and government use.

✓

Can you obtain the required types and geographic coverage of assets and services data?

Analysis process

The process of bringing the data together to assess a community's vulnerability to climate change (and their level of resilience) is as follows. See the worked example for Dandenong City Council in the next section, or Spatial Vision (2023f), for more specific details of the analysis process.

1. Select a community:

- this should be a sub-population or community of concern (see above)
- the council should identify the community as a priority for vulnerability assessment, through extensive consultation with the council and external stakeholders.

2. Identify a climate change variable or extreme weather event of concern:

- different hazards (e.g. flood, storm, fire, heat) may affect different populations.

3. Identify assets and services to the community that increase resilience. This may include:

- recognising the location, coverage, distance or level of service of these assets
- broader community factors that may influence vulnerability or self-sufficiency, such as how self-sufficient the given population is, the general health concerns, and how well-connected or trusting the community is.

4. List all identified vulnerable populations, link these with the climate hazards of concern, include consideration of assets and services, and use a vulnerability analysis framework to prioritise populations that are most vulnerable to the hazards. Analysis should assign a level of importance to each parameter, and may include consideration of the following:

- socio-economic parameters, including health, education and food security, and the availability and distribution of financial assets
- assets and associated services provided, including physical infrastructure such as housing, transport, communication networks or health facilities, and institutional services such as effective governance, institutions and participation
- environmental factors, including the diversity and state of the natural environment
- other planning and institutional considerations.

5. Apply a rating to each parameter based on the climate change event of concern to the identified community, drawing on:
- the analysis framework
- available data
- expert opinion.

6. Combine components in the analysis in a visually interactive format. This will enable insights that may not be clear if the steps are viewed individually. Using the Microsoft Power BI tool, or a Geographic Information System (GIS) platform such as Quantum GIS (QGIS), outputs can be presented in formats such as:
- spatial
- tabular
- map
- text.

Notes

**What are your sources
of the latest data?**

> " *Data can really help to refine projects
> and make them more useful.*

10 Project outputs

Resulting data and mapping tools

After gathering information about climate change, assets and services, and numbers of and types of vulnerable people (and any other data inputs), the analysis outlined above produces results (data outputs) that can be refined, tabulated, mapped and visualised for councils. The output data provides an assessment of vulnerable populations, ranking or scoring these to identify groups at higher risk of climate change impacts.

A useful refinement of the output data is to focus the process on the most vulnerable communities by filtering the data to create more specific population subsets. This can focus the analysis on, for example, a subset of the broader population of older people who are most vulnerable to climate hazards. In this example, older people with one or more other vulnerabilities, such as low income, health concerns, and requiring assistance, would be in a more vulnerable sub-population. Older people who do not have these additional vulnerabilities (for example, financially stable people with no significant medical conditions who can care for themselves) are less likely to be vulnerable to climate hazards.

The final vulnerability scores of the vulnerable sub-population are then ranked from low to high (from 1 to 10). This ranking identifies those in the community with greater vulnerability, enabling councils to determine areas and populations needing greater priority of adaptation to increase resilience.

The output datasets of final vulnerability scores can be analysed in different ways. They can be visually represented (Figure 5) for spatial analysis using QGIS. However, at a region-wide scale, some finer detail can be missed or under-represented on the map, especially if other aspects such as different climate hazards and available community assets need to be considered along with vulnerability. Therefore, the vulnerability scores should be exported into an Excel table detailing the population profile (Figure 6). The tabular version of the data links vulnerability scores, climate changes within an area, and assets located within, or that service, the area.

The vulnerability to climate hazards can be further investigated using Power BI (see Figure 7), which presents complex data interactively. This, and other council systems such as inter-maps, enables councils to import their other layers of data to display indicators of vulnerability to climate change.

The red (and green) boxes provide insights into populations that should be higher (and lower) priority for climate change action. The red boxes in Figure 6 indicate that Cheltenham, Hampton and Highett have some of the higher vulnerabilities in older people, particularly due to likely heat events around 2050. The green boxes show that while Brighton has a high number of older people and higher flood risk, its vulnerability is one of the lowest in the region, possibly due to income and community assets.

The map and table provide a high-level summary of the links within a population profile that, with expert interpretation, can provide a greater understanding of vulnerabilities and priorities across a region.

Have you planned how to embed the project tools, outputs and insights into your council decision-making processes?
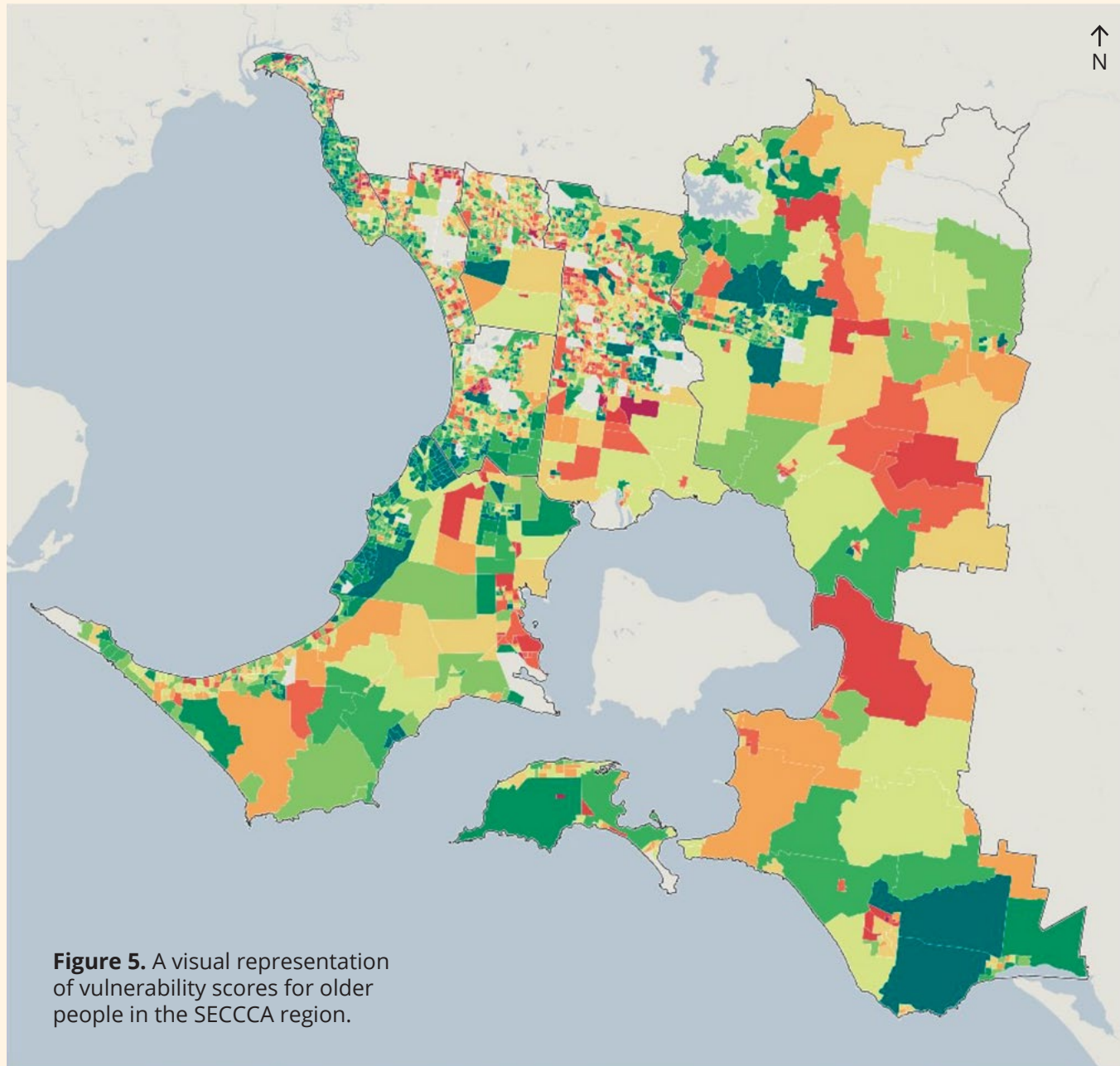
Figure 5. A visual representation of vulnerability scores for older people in the SECCCA region.
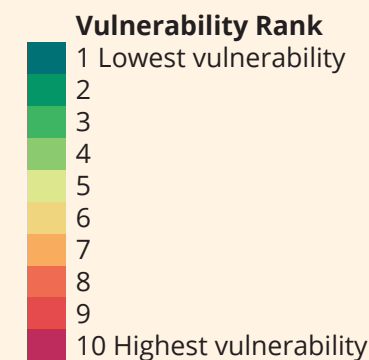
Older Age (age 65+)

Vulnerability Rank
1 Lowest vulnerability
2
3
4
5
6
7
8
9
10 Highest vulnerability

km
0   5   10   15   20

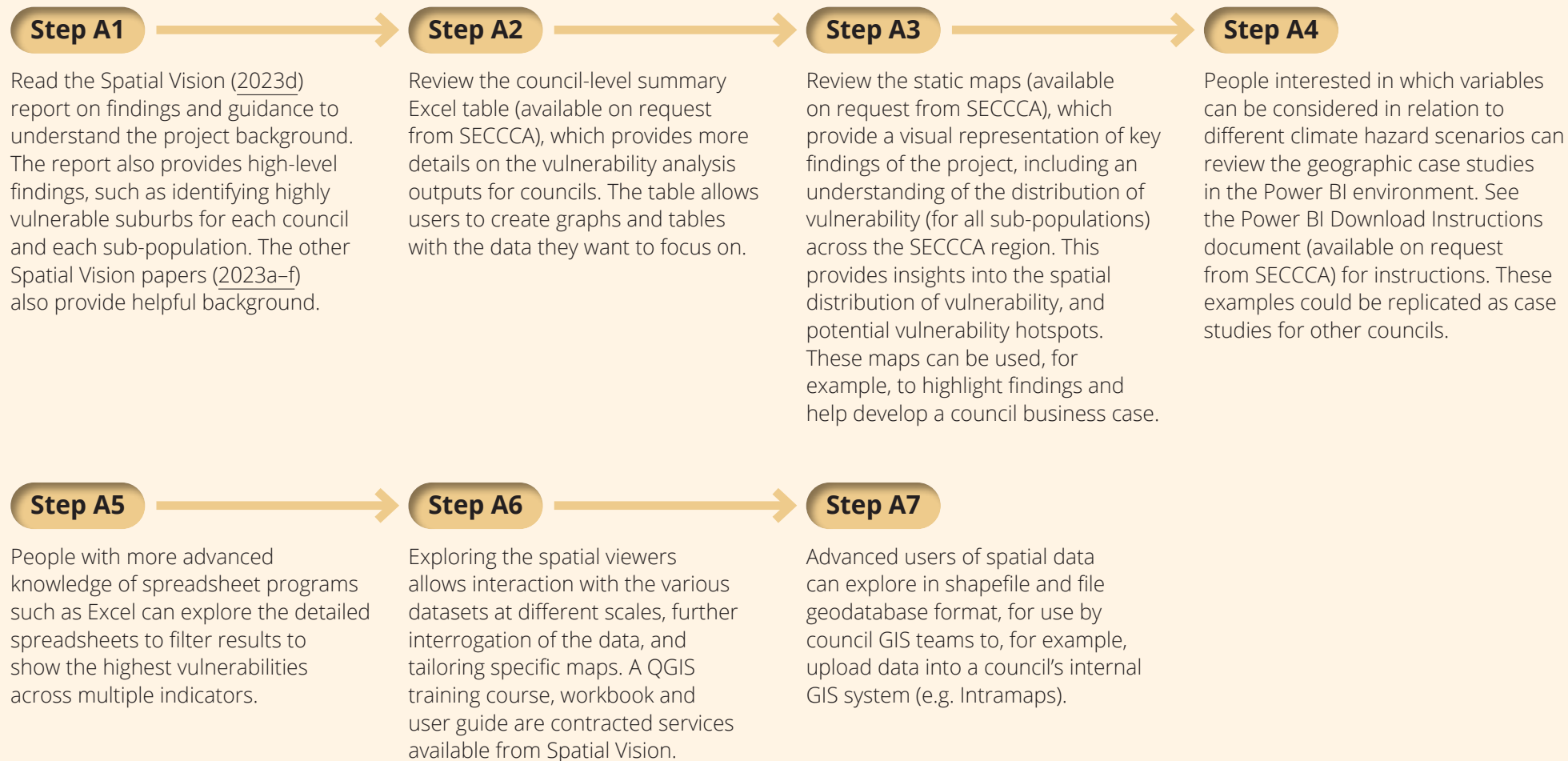| Values	Beaumaris	Black Rock	Brighton	Brighton East	Cheltenham	Hampton	Hampton East	Highett	Sandringham
Age 55 Over - Rank	4	5	3	4	7	4	7	6	3
Age 65 Over - Rank	4	5	3	3	7	3	5	6	3
Age 85 Over - Rank	5	5	3	3	5	4	5	5	4
Age 55 Over Population	5,225	2,748	10,834	6,131	1,725	4,972	1,954	2,196	4,680
Age 65 Over Population	3,157	1,719	6,924	3,708	1,049	2,724	1,102	1,253	2,854
Age 85 Over Population	417	253	1,280	717	174	289	152	196	592
Maximum Temperature - Change from Baseline (%)	9.8%	9.6%	8.5%	9.1%	10.2%	9.0%	10.2%	10.2%	9.3%
Heat Health at 30C (Days) - Change from Baseline (%)	318.0%	318.0%	254.9%	284.8%	344.9%	299.0%	345.5%	345.5%	310.2%
Total Annual Rainfall - Change from Baseline (%)	-5.3%	-4.5%	-3.0%	-3.5%	-4.5%	-3.8%	-4.4%	-4.4%	-4.0%
Combined Flooding and Storm Event (SLR 82cm, 1% AEP) - Coverage (%)	12.0%	1.6%	11.5%	7.3%	1.6%	8.1%	11.2%	12.5%	6.8%
Hospital Count			3			1			3
Police Station Count									1
Public Transport - Bus Stop Count	72	27	123	62	40	80	34	44	61
Health - Doctor Count	1		3	2			2	1	2
Health - Pharmacy Count	3	2	4			1	2		1
Services - Post Office Count	1	2	3						1
Services - Banks Count	4	1	8	1		2	1	1	5

Figure 6. A population profile for older people in a selection of suburbs, which identifies vulnerability rankings, community assets and services, and climate exposures.

Older Age (age 65+)

Vulnerability Rank
1 Lowest vulnerability
2
3
4
5
6
7
8
9
10 Highest vulnerability

Understanding project outputs

The following, first steps (A1 to A7) describe how someone with little background on this project can understand the outputs for the SECCCA region.

Step A1

Read the Spatial Vision (2023d) report on findings and guidance to understand the project background. The report also provides high-level findings, such as identifying highly vulnerable suburbs for each council and each sub-population. The other Spatial Vision papers (2023a–f) also provide helpful background.

Step A2

Review the council-level summary Excel table (available on request from SECCCA), which provides more details on the vulnerability analysis outputs for councils. The table allows users to create graphs and tables with the data they want to focus on.

Step A3

Review the static maps (available on request from SECCCA), which provide a visual representation of key findings of the project, including an understanding of the distribution of vulnerability (for all sub-populations) across the SECCCA region. This provides insights into the spatial distribution of vulnerability, and potential vulnerability hotspots. These maps can be used, for example, to highlight findings and help develop a council business case.

Step A4

People interested in which variables can be considered in relation to different climate hazard scenarios can review the geographic case studies in the Power BI environment. See the Power BI Download Instructions document (available on request from SECCCA) for instructions. These examples could be replicated as case studies for other councils.

Step A5

People with more advanced knowledge of spreadsheet programs such as Excel can explore the detailed spreadsheets to filter results to show the highest vulnerabilities across multiple indicators.

Step A6

Exploring the spatial viewers allows interaction with the various datasets at different scales, further interrogation of the data, and tailoring specific maps. A QGIS training course, workbook and user guide are contracted services available from Spatial Vision.

Step A7

Advanced users of spatial data can explore in shapefile and file geodatabase format, for use by council GIS teams to, for example, upload data into a council's internal GIS system (e.g. Intramaps).

Worked example: understanding project outputs

The following example illustrates how the output data generated by a complex project like the ECR, drawing on a wide array of input data, can be interpreted. The example, which identifies the most appropriate places in Greater Dandenong to implement regular heat-smart workshops for older people and people who need high levels of care, guides those embarking on similar resilience projects on where to start, and how to work through the steps. More details about the worked example, including lists of data, groups of output files, and further resources, are available in the Spatial Vision (2024) report. The report recognises that different types of users require various levels of understanding of the project outputs based on their needs, and their level of comfort and knowledge with data exploration and tools – from people who may only need a broad understanding of the project and its findings, to beginner- and advanced-level data users.

As summarised above, the data outputs include:

• maps at SECCCA-wide and LGA level

• spatial data provided in spatial format and presented in QGIS viewers

• tabular information provided in Excel spreadsheets

• Power BI case studies.

These steps (B1 to B7) describe how to explore the data to provide data-driven insights to support a business case.

Before starting the project

B1. Define the purpose and justification

This example aims to identify the most relevant and appropriate places within Greater Dandenong to implement regular heat-smart workshops, specifically for older people and those who require care.

The work is justified by the community already experiencing extreme heat events, which will continue and increase in future. Older people and people who require assistance are highly vulnerable to these events. Organising local workshops in highly vulnerable areas, especially areas likely to experience more heat-related events, will help prepare these groups for extreme heat events and contribute to overall community resilience.

B2. Identify the main focus

Consider whether you already have a vulnerable sub-population you are concerned about (in the Greater Dandenong example, older people and those requiring care). Do you have a climate hazard you're particularly concerned about (e.g. heatwaves, extreme temperatures)? Also consider any locations you're concerned about.

B3. Consider anything else

Consider the scale to work on – local (SA1), suburb, LGA, or region. The Dandenong example identified the best locations at the suburb level to hold the workshops, with potential to look at SA-1 level hotspots.

Consider broader community considerations that may influence people's vulnerability and self-sufficiency during extreme weather, such as local experience (for example, people living in the area for fewer than 5 years are less familiar with the local climate and weather extremes), health concerns, how well connected or trusting the community is, and assets or services that could reduce the effects of extreme weather.

Also consider broader capacity to adapt. A location may have assets that provide services that reduce vulnerability to extreme weather. Conversely, people may have less access to cool places of refuge (e.g. libraries, community centres, or supermarkets) or public transport.

Analysing the data

B4. Understand the general profile by exploring council data (summary tables).

Review sub-populations to see which suburbs are most vulnerable. Review the climate-related variables – what are the general trends, and do these vary across the region? Review relevant community assets and services.

Some insights can be obtained from an initial overview of vulnerability, including which sub-populations in what areas (e.g. older people requiring a high degree of care located in Dandenong South) are most vulnerable, and what climate extremes are likely to present the greatest risk (e.g. an increase in heatwaves across Greater Dandenong).

B5. Explore the data tables in more detail and create graphs

You can use pivot tables to explore and combine different indicators (such as climate, vulnerability, broader capacity considerations, and broader community considerations) or filter the suburbs by 'top 5' or similar.

Insights from detailed exploration of the data include suburbs most affected by specific vulnerabilities (e.g. high care), which suburbs susceptible to heat have a library or equivalent for the community to take refuge in, experience with the local climate and hot weather extremes (e.g. almost 40% of the population in Noble Park and Noble Park North had different addresses 5 years ago), and public transport access.

You can use the tabular data to create different types of graphs to visualise data and add images to a business case. Consider which variables you want to represent on the graph. A 'combination graph' allows you to present multiple types of data on one graph (for example, to present suburbs on the X-axis, vulnerability ranks on the main Y-axis as bar graphs, and percentage values on the secondary Y-axis as a line graph).

Consider how the data can be presented for different audiences depending on their level of knowledge. For example, different levels of detail are required for engineers, emergency managers, councillors, or the community. Think about what is needed to communicate the usefulness of the output data to those who can benefit from using it.

B6. Explore data using QGIS

Exploring the data in spatial format via the QGIS viewers provides more detail.

For example, the QGIS ClimateViewer helps explore climate futures at a regional level, providing projection data for 3 climate models, 2 climate scenarios, 4 timeframes, current (baseline) data, and historical data from the 1970s to 2010s.

The QGIS Minderoo data viewer provides the same information as the tabular data, but presented at the SA1 level and in spatial format so that hotspots are better identified, and you can investigate the factors driving higher vulnerability scores.

It is possible to upload data from QGIS into a council's internal GIS system (such as Intramaps), to allow people in the council and the community to understand the data without QGIS experience. More resources may be required to help staff use and integrate the output data with council systems. The council GIS officer will need to understand the data and what it shows before uploading it to Intramaps.

Councils will need to determine the most important information to upload, as there is a large amount of data that could be uploaded across multiple timeframes, climate models, and carbon concentrations. That is, councils will need to determine the right cross-section of data for council officers to access through Intramaps.

Assets in the QGIS viewers are state-wide, publicly available data (from Vicmap) so may miss some assets. Input data should be augmented with your council's internally held asset spatial data and any other relevant datasets.

Developing your business case

B7. Use the findings to develop a business case

The information gathered in the above steps can be used within a business case to support justification for action. Based on your examination of the output data, use tabular and spatial data to derive graphs, summary tables and maps. Note the locations and populations that are a priority for your council's climate change planning (in the Dandenong example, these are the suburbs most appropriate to host informative heat-smart workshops).

Other application examples

This Toolkit intends to focus attention on climate hazards, vulnerable populations, and community assets to help LGAs address their own climate change challenges. However, examples of the application of the ERA project by SECCCA councils can demonstrate the range of different applications at a local level. These examples aim to illustrate the use of project results and inspire approaches by other councils. There is also an opportunity for councils to identify region-wide challenges and applications that contribute to larger-scale projects (e.g. infrastructure resilience).

✓

Have you and your colleagues considered possible solutions to the challenges faced by vulnerable communities in your municipality?

SECCCA councils used, or plan to use, the project results in the following ways:

- identifying areas susceptible to heat to provide information that underpins decisions about upgrading buildings, prioritise areas to improve energy efficiency, and protect vulnerable communities

- guiding an intergenerational buddy program by engaging schools to have young people check in on older vulnerable people who live alone

- analysing detailed and updated data to see any change from previous results about urban heat – e.g. new hotspots – to determine if different locations and populations are affected and require different interventions and facilities as part of an urban cooling strategy

- identifying where vulnerable communities need retrofitting of buildings

- planning community-led climate resilience by converting QGIS information into Intramaps (a static mapping system), which enables non-QGIS experts in the community to use and understand the data.

Case Studies

The ECR project included 4 detailed geographic case studies on the vulnerability of communities to a climate hazard scenario within a particular area of the SECCCA region likely to be affected by a climate-change event. These case studies demonstrated how to use information about the vulnerable sub-population and broader community factors, including community assets, in the analysis.

The project selected the 4 case studies listed below from several nominations from councils, based on the priority and severity of the climate hazard scenario; vulnerable sub-populations of concern; relevance to other councils; availability of council staff to assist, and their knowledge; and availability of data to support the assessment.

1. Heatwaves in the growth areas of Cranbourne East and Clyde North

This case study focused on the growth area and new estate regions that already experience, and are anticipated to continue experiencing, intense heatwaves. Heatwave impacts are compounded by the urban heat island effect and low canopy cover.

The community includes high rates of housing stress, people from non-English-speaking backgrounds, and families with young children who are vulnerable to heatwaves.

2. Bushfires in Cockatoo and Gembrook

This case study focused on areas with a high threat of bushfires, with the majority of the area having bushland and forest, and a history of fires. The region is close to remnant bushland and vegetation, and undulating terrain with agriculture, bushland and forest. The region faces socio-economic challenges that increase vulnerability.

If fire risk is escalated with high wind speeds, high temperatures, low humidity, dry fuels and high fuel load conditions, a bushfire could spread swiftly with devastating effects on the short- and long-term viability of the communities and the region. The hills region also leads to a sense of social and physical isolation, with single road access for many communities, and the susceptibility to disruption of the telecommunication and energy infrastructure during a climate hazard.

3. Inundation at Rosebud

The coastal area from Safety Beach to Capel Sound has significant social vulnerabilities, including poverty, homelessness, young people, people with a disability, older people and people with low income. This area is vulnerable to inundation caused by tidal flooding and storm surges.

Climate risks in this area include flooding due to extensive runoff and reduced discharge during compounding rainfall and high tide levels, which threaten low-lying infrastructure; creek outlets becoming buried due to sand migration during heavy rain and storm surges; flooding due to sediment build-up that increases maintenance requirements and environmental threats of inundation of fuel stations or contaminated sites; and flooding of drainage assets in low-lying areas.

4. Inundation south of Mordialloc Creek

This case study focused on people over 65, those who require high care, those on a low income and those experiencing homelessness. In the event of a flood in local streets, older people and people with disabilities who need assistance are at greater risk due to being isolated in their homes without access to support services. Much of Kingston relies on

stormwater pumping stations for drainage, and its low-lying bayside suburbs experience localised shallow flooding during minor storm events.

Spatial Vision (2023e) provides a complete description of the case studies.

The case studies used Power BI dashboards, which provide insights by visualising community vulnerability to climate hazards (see example in Figure 7). The views present complex and big data in a consumable and interactive manner. There is readily understood information on climate, vulnerable populations, other community factors such as the time people have lived in the area and their health, and capacity to adapt to climate events. The multi-page dashboards guide the user through a climate hazard scenario and the vulnerable populations of concern. The dashboard then combines climate and vulnerability information to display indicators of resilience. This format allows councils to use the dashboard to interrogate the project outputs, find meaningful insights, and support decision-making.
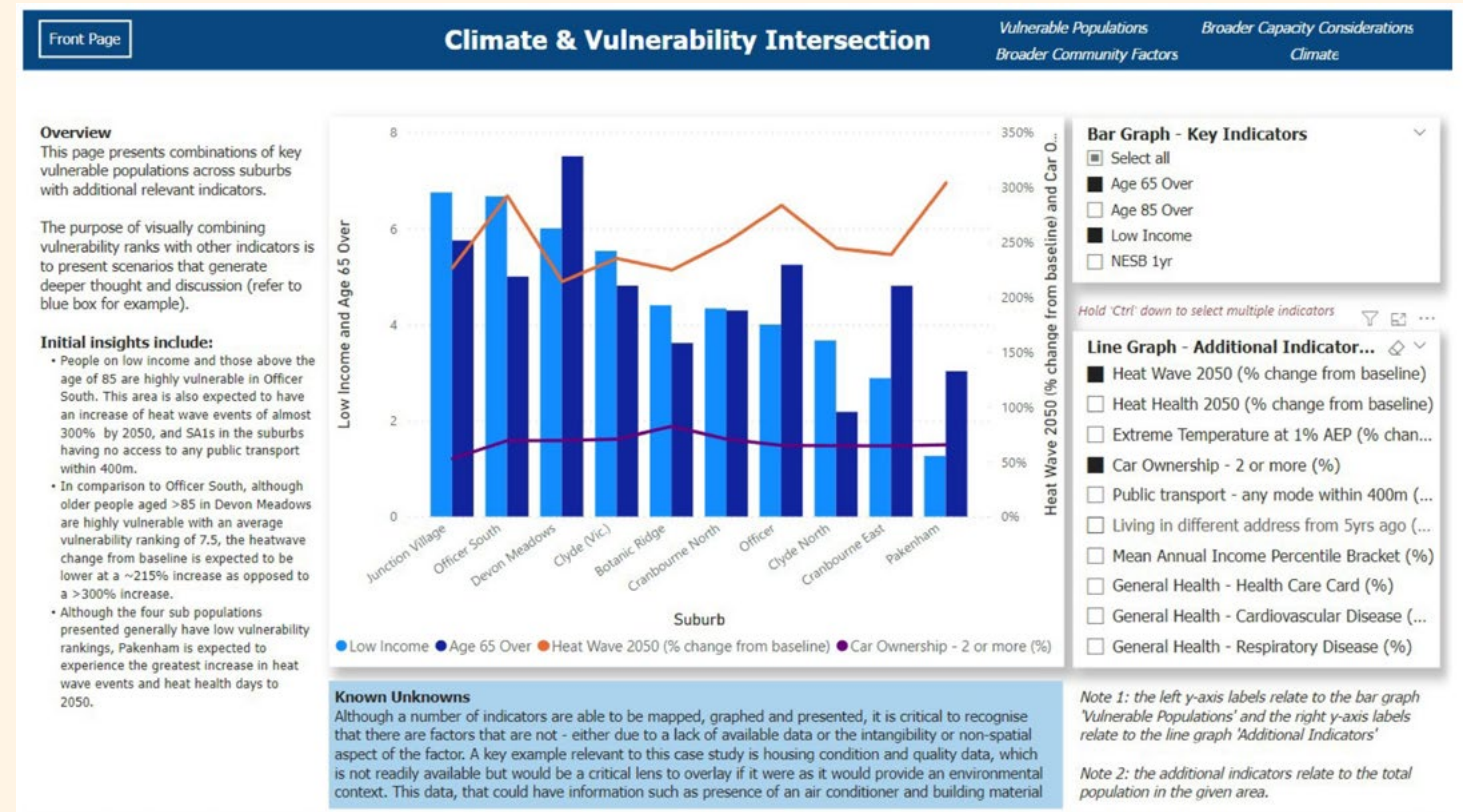

Figure 7. Dashboard combining information on climate (heatwaves), vulnerability (low income, aged over 65) and adaptation capacity (car ownership).

Notes

What are your intended outputs and how will they be used?

> *Read about the methodology first. Ask questions. Play with the data. Discuss with colleagues. Work together. Make use of resources.*

> *Discuss your findings with colleagues in other departments to help understand the broader context.*

> *We found integrating the data into existing systems supported greater uptake and use across the organisation.'*

11 Co-design pilot projects

The ECR project completed 3 pilot projects to illustrate its implementation: one internal co-design project, involving all 9 councils, examined the best way for organisations to understand and use the findings; 2 other co-design projects addressed the vulnerability of older people in Bayside City Council, and of young people in Frankston City Council.

What is co-design?

Co-design – sometimes called co-production or co-creation – refers to a collaborative approach to designing and delivering a project that involves all stakeholders (including users of the products, staff, partners, citizens, and customers) in the design process. This inclusive process aims to ensure the resulting products, services, solutions or activities meet the needs of everyone involved.

Co-design processes are best used for complex projects with a perceived power imbalance, and where building trust and shared understanding are as important as solving a specific problem.

The facilitator in a co-design process should select a mix of participants, tools, and activities to help reach the outcome for each process (see suggested approach in Figure 8). The ECR pilot projects engaged Authentic Co-design to facilitate collaboration with the communities of interest.

The following criteria, developed in consultation with participating councils and with reference to the ECR project objectives, guided the co-design of pilot projects.

1: Is the suggested pilot project:

· scalable across, and relevant to, other parts of Australia

· inclusive of at-risk, vulnerable sub-populations?

If yes to both points, respond to these questions (in order of importance):

1. How ready is your council to support a co-design process for this vulnerable sub-population?

2. How willing are relevant community stakeholders to participate in a co-design process (and how well do you know relevant community leaders who can support this process)?

3. How confident are you that funds could be generated or accessed to help implement co-design outcomes?

4. How much interest is likely from other SECCCA councils?

If your suggested pilot co-design project scores strongly on these questions:

· can results from this co-design pilot suggestion be practically implemented within 6 months?

Based on these criteria, the ECR project undertook 3 pilot co-design case studies (SECCCA, 2024c).

START

Week 1:
Initial scoping
Identify participants
Determine questions
Identify experts
Plan monitoring and reporting

Weeks 2–6:
Plan 1st workshop
Meet with organisations as required
Design activities and test them
Produce collateral for workshop 1

Weeks 7–8:
Facilitate workshop 1:
· identify co-design questions
· brainstorm ideas and solutions

Week 9:
Debrief

Weeks 10–14:
Plan 2nd workshop
Develop solutions and scenarios
Meet with organisations as required
Design activities and test them
Produce collateral for workshop 2

Weeks 15–16:
Facilitate workshop 2:
· critique solutions
· strengthen solutions and trial ideas
· identify stakeholder contributions

Week 17:
Debrief
Decide if 3rd workshop is needed
Scope 3rd workshop if required

Weeks 18–22:
Develop draft action plans and accountabilities
Produce collateral for workshop 3

Week 23–24:
Facilitate workshop 3, if needed
Finalise action plan
Commence planned monitoring and reporting

END

Figure 8: Co-design processes and timeline

Organisational (internal) co-design

The organisational co-design workshops aimed to help the PWG (including all 9 Councils) find the best way to understand and use the findings from the ECR project. This would enable councils to then work with the communities most vulnerable to the impacts of climate change to improve council services to promote community climate resilience.

The workshops responded to feedback, noting that councils needed support to best embed the project's data, platforms, tools and findings into council strategies and operations. They were also prompted by agreement that the best way to understand and use the data was to apply it to real-world examples. PWG members wanted to learn about the data available for their area and how to interrogate vulnerabilities, identify key risks for the council, and how to apply the data by learning more about the tool's use and limitations.

The workshops, held in mid-2023, identified super-users – a group within councils (not all in one team) who understand how to use the data and tools to educate others about their use. Council staff learned from other councils about how they are using the data and tools, applying the findings, and changing mindsets to promote adaptation and resilience.

Participants examined the data to identify areas of higher vulnerability (and hence community resilience opportunities) and prioritise the next steps (including sharing specific examples of projects each council is considering, learning from case studies or thinking by others, and establishing if there are quick wins).

This input led to the design of the mentoring, the timing of the steps in the co-design project plan, and the objectives for each step described in the section above. It showed how to embed and continue using the tool in relevant areas across the council, including producing a detailed and practical plan for a business case for addressing a high-priority vulnerability.

Bayside council and older community members co-design

In August 2023, 33 older members of the Bayside community met to consider how residents over 55 could be better informed and supported to become more resilient in preparing for, and coping with, extreme weather events.

The 33 participants were recruited through council advisory bodies, networks and word-of-mouth. They formed a co-design panel and, at 2 sessions held a week apart, were provided with information and invited to respond to several important questions. Many participants undertook additional research between those meetings and recorded their thoughts to feed into the second session.

At 2 follow-up workshops in February 2024, 20 community representatives met to identify locations, facilities and assets suitable for older community members to access during extreme weather, with a focus on heat and power outages. The participants listed and mapped areas where people could shelter from extreme weather, including libraries and shopping centres (Figure 9).

Participants also developed an extreme weather readiness self-assessment checklist (Figure 9). The checklist prompts discussion about locating nearby safe places, preparing to stay safe during extreme weather events, identifying gaps and future planning needs, and building greater resilience.

There was an overall agreement that the self-assessment checklist and map of cool locations were useful tools. The participants provided ideas for the timing and ways of communicating the resulting information brochure to Bayside residents, including distribution of the brochures to relevant locations, a launch event, and presentations at relevant clubs.

The final brochure was provided to SECCCA for use as a template in other Councils. It was supplied to Bayside for finalisation and distribution, including as a printable PDF, an accessible online PDF, and an online PDF that could be downloaded and printed at home.

The timeline for the co-design project did not accommodate appropriate internal council engagement to enable approvals while delivering community co-design commitments. Hence the InDesign files were supplied to enable further development and increase reach and accessibility, such as translations into other languages and production in large-text format.
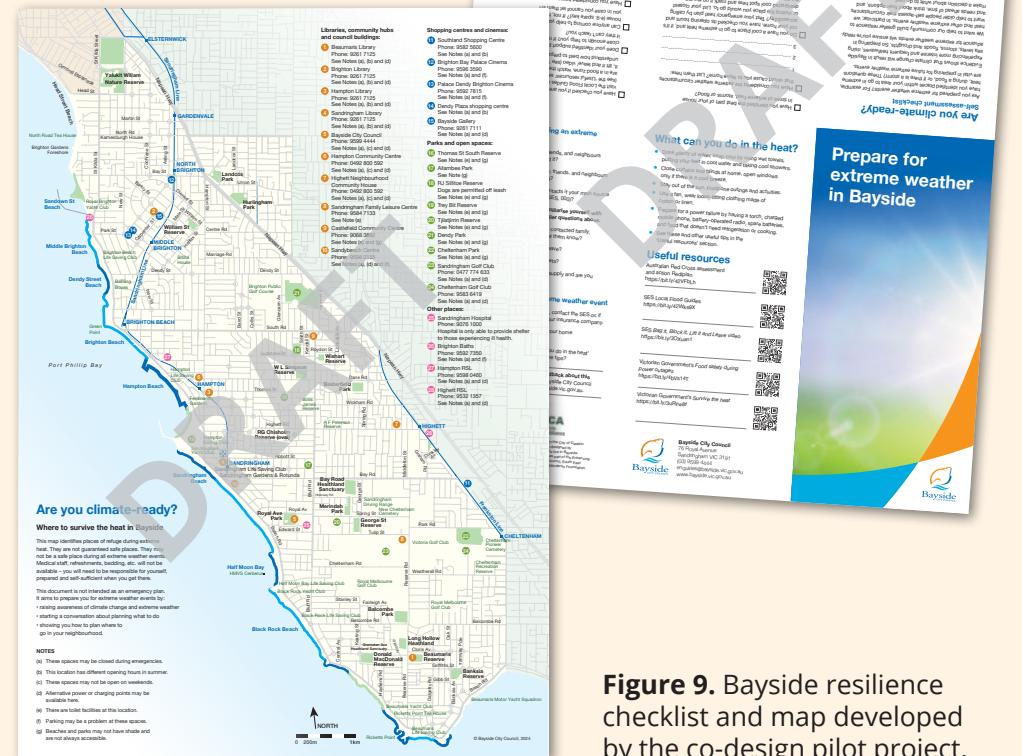

Figure 9. Bayside resilience checklist and map developed by the co-design pilot project.

Frankston City Council and youth co-design

In October 2023, 11 Frankston-based students aged between 14 and 16 met to consider how younger residents could be better informed and supported to become more resilient in preparing for extreme weather events. The students were recruited through teachers at 2 schools.

The students shared experiences of extreme weather events, including 5 bushfires, 4 storms, 3 floods, and 2 heatwaves. They considered climate change information and responded to questions about what they know, need to know, and what they think Frankston youth would like to know. The students displayed energy, insights, and ideas, and teachers provided support to help all students participate. Students respected each other's ideas and were keen to have ongoing involvement.

Students then worked with consultants, funded by the ERC project, to produce a video to be shared mostly through social media and at school assemblies. The video project included identifying a suitable host to publish on social media (as students noted that the video would be unlikely to appeal to young people if published via council channels).
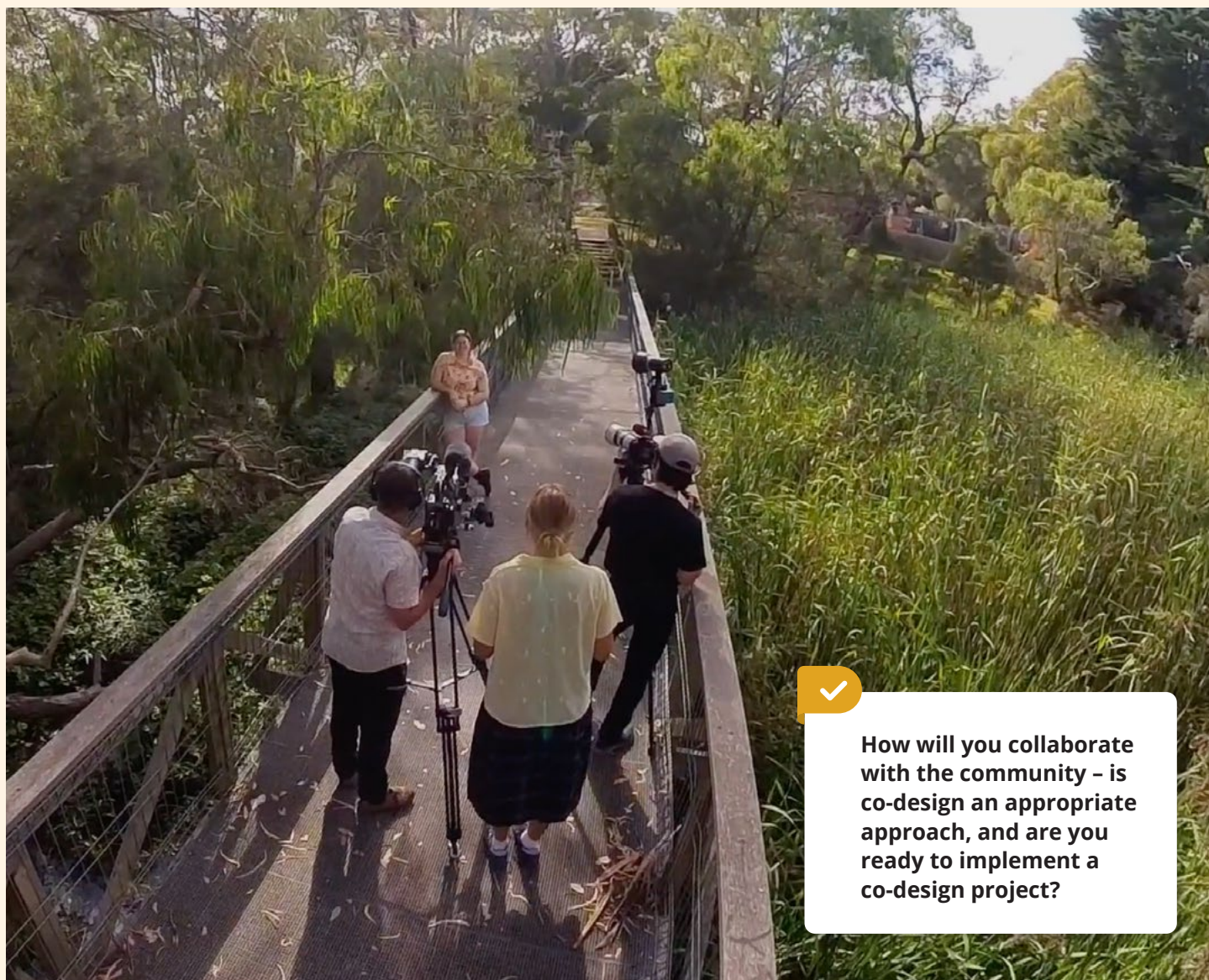
How will you collaborate with the community – is co-design an appropriate approach, and are you ready to implement a co-design project?

Notes

Are you considering a co-design project involving your community?

"Faithfully following the co-design process takes time, but the results deepen our knowledge of the community and support future work not yet undertaken.

"If using a co-design approach, be aware of how well participants may represent your overall audience. Mobile, healthy older adults don't necessarily understand the needs of isolated, vulnerable older people.

12 Communication and engagement

Communication about the project and its outputs needed to reach diverse groups with a range of languages (over 150) and cultures, as well as some audiences with scepticism about climate change and the need for action. This raised several potential barriers to communication.

It was important to identify the audience, what they needed to know, and their understanding of the data and results. Information needs to be tailored for its audience (see step B5 in the worked example, above). While tailored data outputs were not produced for this project, other councils should consider this when planning similar projects.

Communication plan

The project developed a communication and engagement plan early on, updating it as the project progressed. The plan described how to deliver the communication and engagement objectives, targeting the various and complex audiences of the project. Early in the project, communication focused on communication with audiences associated with the project. Later, communication focused on communicating to target audiences (those who will benefit from the use of the outputs) specific to the co-design phases, and to the broader community for the release of outputs.

The ultimate communication and engagement goal was to communicate the project and its outputs simply and clearly to enable the intended change.

It is important to be sensitive to the lived experience of community members when discussing climate change impacts and disasters. This is a complex subject, and the project may cause some people to be anxious.

This project seeks to develop actionable tools to create pathways for adaptation – and hence to increase confidence and resilience over time.

Eleven principles influenced the application of communication and engagement for the project, and underpin all tools and products created:

- communicate early
- be empathetic and respectful of communities
- be inclusive
- be collaborative
- make evidence-based decisions
- use clear messaging
- use plain language
- be open and transparent, and tell it straight
- ensure relevance
- build capability for other messengers to deliver the messages as a part of this project
- enable flexible branding.

Audiences

There are 2 main audience groups, each with a different communication and engagement objective.

For the early stages of the project, the primary audience was people doing the work, or identified as key stakeholders needed to enable the project (e.g. council executives). The goal was to make the outputs accessible in order to understand the level of risk to the community and take appropriate actions to fulfil councils' obligations to disclose these risks, and ensure project outputs are implemented and change behaviour to improve resilience in the LGAs and community.

The secondary audience included stakeholders external to the project's work within SECCCA councils (the communities affected, council partner organisations, council staff not involved in the project and broader groups to influence). Early in the project, the goal was to raise awareness that it was occurring, that the outputs are designed to help them, and how it is relevant to them and their roles. Later in the project, the goal was to ensure that the project's outputs were implemented.

Key messages

The communication and engagement plan identified 6 messages that are consistent across all audiences.

1. Climate change affects you, your community and your role in many ways.

2. There are practical ways to adapt to climate change and support our communities.

3. Resources and tools from this project will support (rather than add to) your work.

4. Everyone has a role to play in making this project a success.

5. This project will help Councils to support their communities better, both in and out of the SECCCA region, and is scalable and repeatable in other Councils and organisations.

6. Funding is from the Minderoo Foundation to support building community resilience, locally and nationally.

Other messages were developed for the specific audiences identified above.

Processes, products and platforms

Internal or external communication activities will require approvals within the organisations involved. Suggested communication channels included:

- short updates to use in existing channels (e.g. council newsletters and webpages)

- briefings to council executives and managers, and short presentations to council meetings

- internal staff channels (e.g. email, news feed, intranet portal, CEO messages)

- social media posts

- events, workshops, and presentations

- channels of trusted local partners

- media releases for media (radio, newspapers) and short stories in local papers and radio

- flyers and advertising.

Helpful communication approaches include:

- key message document for consistent messages

- fact sheet about the project

- presentation slides for team members

- short videos and animations

- interactive workshops showing the project outputs applied via case studies

- agenda item on regular team meetings about the project outputs and uptake

- continued training for new users of tools, and induction of new staff

- presentations at conferences

- Ministerial briefing note to local government minister highlighting the project.

Have you considered internal and external communication, and do you need a communication plan?

Notes

Do you have a communication plan? Who are your audiences?

> *Being clear about your audience from the start is critical.*

> *Involving your communication and engagement team early keeps things moving in the right direction.*

13 Evaluation

The ECR project achieved its aims of delivering the data, information, tools, frameworks and approaches needed to identify and help populations vulnerable to climate change. Final evaluation interviews and comments show that the project's delivery of a significant, new capability on climate vulnerability to 9 councils will be a valuable resource for councils, SECCCA and community members. The project showed that councils can work constructively and collaboratively with the community on complex and challenging climate vulnerabilities to offer services that help build resilience.

At the mid-project point, the project was on track. Some required interventions were planned and delivered. By making these small changes in response to feedback from councils, the community, and project governance groups, the project provided the desired outcomes.

There is now an opportunity for councils to lead and deliver further outputs, increasing the ECR project's impact. Work needs to be done to embed the long-term outcomes: specifically, improving community resilience to reduce the effects of climate change on council services, assets and vulnerable communities, and increasing community-stakeholder-council partnerships for climate adaptation.

The resources now available to SECCCA, councils and the community are targeted, extensive and impressive and likely to improve community resilience.

Lessons learned

The main lessons learned from this project, which are important for any organisation or council before embarking on this type of project, are summarised below.

Scaling to other regions: It is possible to scale the enhancement of community resilience to other locations nationally using the template and lessons learned from this large-scale, regional pilot project. The project showed the complexity of working with challenging datasets and vulnerable communities while acting as a proof of concept. Lessons from the pilot project will improve the efficiency and delivery of similar projects in different regions and on larger scales.

Implement good project management: Flexibility, through the adaptative governance approach, was essential for a project this complex. The clear governance process aligned the project with the outcomes at various times, helped track that the project was achieving its objectives, and identified any need to change course. Careful planning and project management are essential. Success comes from sound leadership.

Co-design with communities: The project demonstrated how to co-design climate resilience-related council services with communities. Collaboration and connection are fundamental, and the community is an invaluable asset. It is essential to ask, listen and learn.

The 2 pilot projects involved vulnerable communities (older people, and school-aged youth), councils and consultants working together to design council services, crafted for the community involved, that build resilience. Case studies and demonstration projects can show how to use project outputs. However, while the pilot co-design worked with these communities, other projects may require more effort, capability, energy and focus in different situations.

Council relationships are essential: The project must be led from within councils, with constant engagement with council officers. Over the project's timeframe, some council officers' roles changed, and some councils had other priorities, which resulted in variable engagement with the results. Ensure council leadership teams are engaged, because council mandates are crucial

for resourcing, risk management and embedding the findings into council practice and operations. Engage management and colleagues by running internal briefing sessions, showing that the project operates across departments and can solve council planning and strategy issues.

Understand the resources required: To ensure council officers can dedicate time to the project, it is important to prioritise and build their capability. Ensure there is time to analyse and understand the data. Approximately 14 days (equivalent full-time) of work, spread over about 3 staff at each council, was needed over the 2 years of the ECR project – this is essential for planning and managing expectations. Maintaining knowledge during staff turnover is required. Manage staff turnover by ensuring that project details are incorporated into business plans and making reports and data visible in internal systems, with an internal guide on using them. Funding must be secured to enable the involvement of consultants.

Manage capacity and time restraints, and budget and resource constraints, by aligning project data with council business plans and establishing an internal community of practice to ensure that resources support achieving the project goals.

Understand the data: Using the data for decision-making requires focus, effort and time. To address this, the project ran a co-design project with all 9 Councils to determine the best way to understand and use the findings from the ECR project. This identified ways to work with the communities most vulnerable to the impacts of climate change to improve council services that will enhance community climate resilience. By the end of the internal organisational co-design activities, most councils had a draft or final project concept plan for business planning that drew on the project data, and was aligned to the strategic needs of their council. Illustrate how the data can be used by determining the questions you want answered, reading background reports, analysing maps and spreadsheets, and using case studies and stories. Acknowledge the limitations and timeliness of data to managers and users so they understand that planning and financial decisions are based on the best available information that may need to be updated.

The output platform for the resulting data is important: The 9 councils used different internal software programs and platforms. The software needs to be flexible and as simple as possible so that councils can consume vast amounts of data like that produced in this project.

Use a resilience framework: The Minderoo Resilient Communities Framework is consistent with the principles and approach of the ECR project. Hence, there is an opportunity to use this framework in similar future projects with the template (and Toolkit) from this project.

Pause and reflect mid-project: The planned mid-project pause was necessary to regroup, embed the project's data into council processes, and plan the scope and delivery of the co-design phase. However, the pause needs to be longer than the 4 weeks initially planned – at least 3 months.

Adapt to new information, but avoid scope creep: Vigilance to prevent scope creep is important. There is a natural tension between delivering on the original scope and adapting the scope as knowledge and details mature. The field of community resilience evolved over this project's 2-year timeframe, so new ideas and frameworks needed to be incorporated.

Communicate often and clearly: Coordinated and consistent communication is crucial for internal project staff, broader council staff, and communities. Tailor engagement activities to the audience. Create content to communicate internally and externally. Language needs to be clear, accessible and understood by audiences with different levels of knowledge.

Other lessons:

- executive mandate and council buy-in are essential

- governance roles and a Project Control Group enables efficiency, and its commitment is essential

- know your role and make time for it

- build relationships with council officers, and meet them early in the project

- sound contractor management is crucial

- use co-design

- council time tracking is important

- learn from previous projects

- consider tiered participation based on council readiness

- manage consultants and contractors rigorously

- be closely involved in the evaluation

- make time from the start to prepare, plan, and build capability

- increase collaborative opportunities

- plan communication early, and resource it

- ensure administrative support

- provide funds for First Nations engagement.

More details on the evaluation and lessons learned are available in the SECCCA ECR Project Final Evaluation report (available on request from SECCCA).

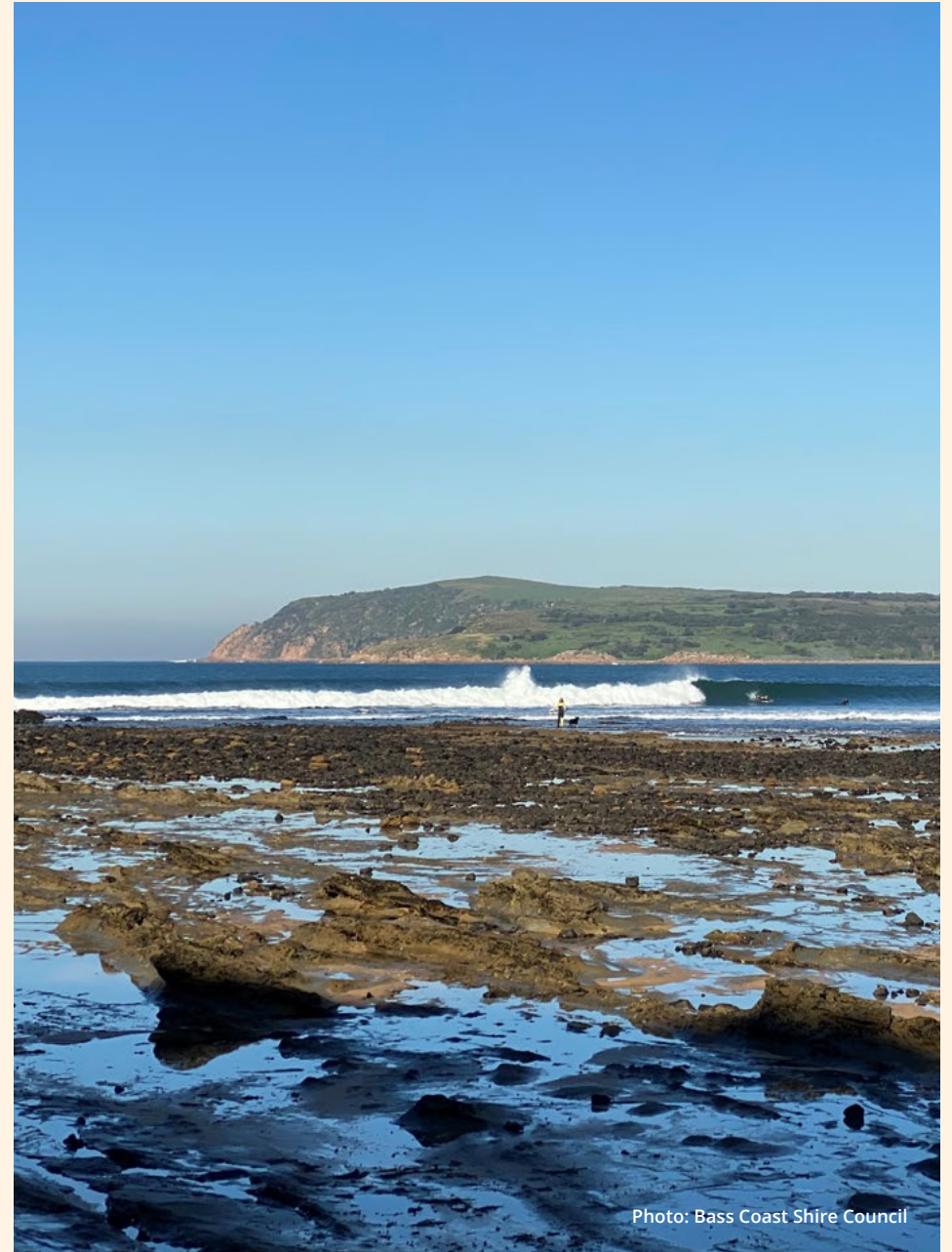✅ **How are you evaluating your project – what are your measures of success?**

Photo: Bass Coast Shire Council

14 Recommendations to promote impact

Following the ECR project's completion, the evaluator made the following 5 recommendations to maximise the successful delivery of the ECR project's outcomes over the longer term.

Promote the project

Communicate the project and its findings. Discuss the lessons learned, and tell everyone that complex projects can be completed successfully. Communicate the project to management, perhaps through an event focussing on how to embed climate risk in council decision-making.

How will you promote impact and ensure the long-term success of your project?

Promoting the potential breadth and depth of how the results can be used is important. The data and findings could be used in projects as varied as adaptation action planning, energy transition, road planning, playground upgrades, environmental justice, social policy, intergenerational support, and whole-of-council climate change strategy development.

Consider the lessons learned

Many of the lessons in the previous section are general enough to be applicable not only to SECCCA and councils in the SECCCA region, but also to councils and other organisations throughout Australia. They can help councils deliver climate vulnerability assessments and other projects successfully.

Carefully consider co-design

If embarking on a co-design project, be realistic about the readiness for your council to share power as required by co-design. Tools and professionals are available to help assess readiness as part of a self-assessment by any leadership group embarking on a co-design process. There are ways to increase co-design capability and other related collaborative techniques to work with communities to make decisions.

Communities will play a fundamental role in climate adaptation. Build on community relationships and other council projects rather than starting relationships or projects from scratch. Ensure timelines accommodate appropriate internal council engagement to enable approvals while delivering community co-design commitments.

Brave leadership from councils is required for co-design. The co-design activities in the ECR project involved council officers committed to creating climate resilience services for the community and by the community, but the process still required strong leadership.

Ensure leadership and maintain momentum

Leadership by organisations, people in the governance groups, and council officers is vital to the success of a project like this. It needs a lead organisation with a vision, that is highly efficient and competent, and wants to lead (in this ECR project, SECCCA provided leadership). It needs a diverse, functional and competent PCG willing to lead. It also requires the leadership of council officers – the data and spatial tools will not create change; it will be the council officers who create transformational impact.

The successful uptake and use of the tools and findings from this project need to be driven by individual councils for their, and their communities', benefit over the longer term. One way to maintain momentum is establishing an ECR Community of Practice among interested council members over the next 2 to 3 years. This would support the use of data and tools to realise the benefit of the investment in the project.

In addition, there is a need to start building climate resilience into council work. A Community of Practice could share any actions or business plans across councils, especially the details of costings and work plans.

Building community resilience to climate change requires a whole-of-council response. There is an opportunity for councils to create a community climate resilience role to coordinate across council business units that contribute to building community resilience to climate change.

Develop acquired and transferable skills

The ECR project has resulted in valuable and transferable skills and organisational capabilities within the councils involved. These include co-design skills to work with communities to design service delivery, data analysis, using data in decision-making, and cross-organisational collaboration. Such skills are built, practised and grown in a project like this. It is vital to continue to use and apply these skills, and to develop and maintain them in councils, so they can have far-reaching and lasting impacts in building community resilience to climate change, as well as delivering other challenging and complex programs.

Notes

How will you evaluate your project?

> *The adaptive approach has been a real stand out, as well as support for a rigorous governance process.*

> *The evaluation process has enabled effective adaptive management along the way. Regular check-ins helped to keep the project on track.*

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16 Appendix: Abbreviations and glossary

Abbreviations used in this toolkit

AEP	Annual Exceedance Probability
AVA	Asset Vulnerability Assessment
CALD	Culturally and Linguistical Diverse
CMSI	Climate Measurement Standards Initiative
DEECA	Department of Energy, Environment and Climate Action
DELWP	Department of Environment, Land, Water and Planning
EAGA	Eastern Alliance for Greenhouse Action
ECR	Enhancing Community Resilience
GIS	Geographic Information System
ICA	Insurance Council of Australia
IPCC	Intergovernmental Panel on Climate Change
ISSB	International Sustainability Standards Board
LGA	Local Government Area
NAGA	Northern Alliance for Greenhouse Action
NESB	Non-English speaking background
NFID	National Flood Information Database
PCG	Project Control Group
PPM	Parts per million
PWG	Project Working Group
QGIS	Quantum Geographic Information System
RCP	Representative Concentration Pathway
SA1	Statistical Areas Level 1
SECCCA	South East Councils Climate Change Alliance
TCFD	Task Force on Climate-related Financial Disclosures
TRG	Technical Reference Group
WAGA	Western Alliance for Greenhouse Action

Glossary used in the ECR project

ACUTE (ABRUPT) EVENT: Climate change events with a short timeframe and sharp response, such as a 1-in-100-year event.

ADAPTATION (AND ADAPTIVE CAPACITY): The ability of a system to adjust, modify or change its characteristics and actions to better respond to existing and anticipated future climatic shocks and stresses (including climate variability and extremes) to moderate potential damages, cope with consequences, or take advantage of opportunities.

CHRONIC (INCREMENTAL) EVENT: Climate exposures or variables with a long-term timeframe and slow response; mainly relates to climate change over time (for example, temperature increases over time).

CLIMATE: Average weather condition of a particular place over a long time.

CLIMATE CHANGE: Long-term changes in regional climate patterns as influenced by anthropogenic impacts such as increased greenhouse gas concentrations.

CLIMATE HISTORY: Builds on the insights of paleoclimatology (the reconstruction of past climates from the archives of nature) and historical climatology (the reconstruction of past climates and weather from the archives of societies), as well as the methods of conventional history.

CLIMATE RESILIENCE: The ability of a system to absorb and recover from climatic shocks and stresses, while positively adapting and transforming their structures and means for living in the face of long-term change and uncertainty.

COMMUNITY ASSETS: Physical assets that provide services to selected sub-populations to mitigate the vulnerability of the community (or sub-populations within the community) to the impacts of climate change provide broad support to the general community as an indicator of broader community resilience or vulnerability across a larger geographic area.

CONSEQUENCE: The change in circumstances experienced by a community or its members as a result of an event and its subsequent management. A consequence approach moves the focus from a specific hazard, such as fire or flood, to broader consequences that may affect a community regardless of the hazard source. Despite how resilient a community is to shocks and stresses or how well prepared it is for emergencies, events will occur that exceed a community's levels of resilience and preparedness.

DISPERSE NON-FUNCTIONAL COMMUNITY: A grouping of disparate individuals with no common communication or institutional linkages, e.g. homeless people.

EXPOSURE: The influences or stimuli that impact a system. Exposure is a measure of the predicted changes in the climate for the future scenario assessed. It includes direct variables (such as increased temperature) and indirect variables or related events.

EXTREME WEATHER: Phenomena that are at the extremes of that experienced historically at a location, especially severe or unseasonal weather. A flash flood and a heatwave are examples of extreme weather.

FUNCTIONAL COMMUNITY OR NETWORK: A grouping based on common interests or cultural links that have communication and institutional linkages (e.g. community of faith).

GEOGRAPHIC COMMUNITY (AREA OF INTEREST): A defined geographic location or extent, typically a rural town, e.g. the township of Cockatoo.

HAZARD: A process that has the potential to affect an area to a degree that assets associated with that location may be at risk, such as storms and flooding.

IMPACT: The effect of particular hazards – including extreme events such as storms and other climate events – on the natural or built environment. It relates to the exposure of an asset to a particular hazard and the sensitivity of that asset to that exposure.

MITIGATION/ABSORPTIVE CAPACITY: The ability of a system to prepare for, mitigate or recover from the impacts of negative events using predetermined responses to preserve and restore essential basic structures and functions (not to be confused with the reduction of greenhouse gases, also referred to as mitigation).

RESILIENCE: The ability of a system to deal with shocks and stresses while retaining the same basic structure and functioning, the capacity for self-organisation, and the capacity to adapt to stress and change.

RISK: The potential to lose or gain something of value based on particular actions or inactions. A risk assessment, or analysis, is the process by which these potential risks are evaluated, and the projected consequences are defined.

SENSITIVITY: The responsiveness of a system to climatic variables, and the degree to which changes in climate might affect that system in its current form. Sensitive systems are highly responsive to climate and can be significantly affected by small climate changes. This term is often used interchangeably with the term 'susceptibility'.

SUB-POPULATIONS IN THE COMMUNITY: Groups defined by common socio-economic demographic parameters, e.g. those over 65 and living alone.

TRANSFORMATION/ TRANSFORMATIVE CAPACITY: The ability of a system to fundamentally change its characteristics and actions when the existing conditions become untenable in the face of climatic shocks and stresses.

VIRTUAL COMMUNITY OR 'NETWORK: A group, including online communities, that is actively connecting through, for example, social media forums and gaming.

VULNERABILITY: The degree to which a system is susceptible to or unable to cope with shocks and stresses. Vulnerability is a function of the character and magnitude of shocks and stresses to which a system is exposed, its sensitivity, and its adaptive capacity.

WEATHER: Day-to-day information about the changes in the atmospheric condition in any area. It refers to short-term conditions or events. In relation to climate change, an abrupt shock or event is often referred to as an extreme weather event.

To discuss the project, please contact SECCCA
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