



800,000 Days of Learning at Stake

Building climate-resilient early childhood education across Australia

STATE OF AUSTRALIA'S CHILDREN
EVIDENCE TO ACTION BRIEF

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A note about terminology: We use a variety of terms that have specific meaning in the context of the environment and climate resilience including:

Hazard – The potential occurrence of a natural or human-induced physical event or trend that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems and environmental resources (IPCC Glossary)

- Slow onset hazards develop slowly like droughts or pollution
- Sudden onset hazards develop quickly like floods, fires and storms

Disaster – A 'serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic and environmental losses and impacts' (UNGA, 2016 in IPCC Glossary)

Adaptation - In human systems, the process of adjustment to actual or expected climate and its effects, to moderate harm or exploit beneficial opportunities (IPCC Glossary)

Mitigation – A human intervention to reduce emissions or enhance the sinks of greenhouse gases (IPCC Glossary). In human systems, the process of adjustment to actual or expected climate and its effects, to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate and its effects (IPCC Glossary)

Executive summary



The scale of the challenge

Early Childhood Education and Care (ECEC) services offer stable and supportive environments that enable children to learn, develop and reach their full potential. Climate change is already disrupting ECEC across Australia.

In 2025 alone, over 2,000 preschools, kindergartens and long daycare centres (around one in six) closed due to climate hazards including bushfires, cyclones and floods. Combined, children aged 0–5 lost nearly 800,000 days of early learning as a result (The Australian Child and Youth Wellbeing Atlas at University of Western Australia based on data from The Australian Children's Education and Care Quality Authority (unpublished)).

These disruptions are not isolated incidents. Australia's National Climate Risk Assessment projects more frequent and intense climate hazards, heatwaves, floods, coastal inundation, and bushfire risk. Without investment in mitigation and adaptation, the impacts on children's wellbeing across the six domains of The Nest Wellbeing Framework - from Healthy and Learning to Valued, Loved and Safe - will worsen.

Why early childhood matters

Early childhood is the most critical period of human development. Ninety per cent of brain development occurs in the first five years of life (The Front Project, n.d.). Disruptions to safe, stable environments during this window can have immediate and lasting consequences, including:

- ① Physical health impacts from pollution, smoke inhalation, heat stress, water-borne disease, and food insecurity
- ② Mental health and wellbeing impacts including trauma, anxiety, family functioning and attachment disorders
- ③ Learning loss, with evidence showing both immediate and delayed impacts on children's learning
- ④ Widened inequality, as children facing the greatest adversity are also most exposed to climate risks and least likely to have access to quality ECEC



1 in 6

ECEC services closed due to climate hazards in 2025



11,000

Total service closure days



Around

800,000

Children's learning days lost

The Australian Child and Youth Wellbeing Atlas at University of Western Australia based on data from The Australian Children's Education and Care Quality Authority (unpublished).



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ECEC services are more than educational settings. They are critical community infrastructure and provide stability, safety and continuity for children and families, including in a changing climate.

There is a lot we can do to strengthen ECEC systems and support children to learn and thrive in the face of increasing and worsening climate hazards.

Pillars of climate-resilient ECEC

Strengthening ECEC resilience requires investment in both physical and social infrastructure.

Physical infrastructure

Climate-resilient buildings and environments help children to learn and stay safe. From retrofitting existing environments to maximise shade, improve ventilation and utilise sustainable energy sources, to ensuring new buildings are built to withstand climate events, there is a lot we can do to support children's safety and the continuity of children's learning.

Social infrastructure

Educators, systems and community connections are equally vital. ECEC services support children's learning about the environment and contribute to community capacity to recover from climate hazards. This includes age-appropriate hazard preparedness and linking families to wrap-around support. There is more we can do to support educators, including to deepen sustainability teaching and to engage in best practice disaster management.

A timely opportunity

With record and welcome \$1 billion government investment through the Building Early Education Fund, now is the time to embed climate resilience to safeguard current and future investment.



Investing in climate-resilient ECEC is not only an education priority, but also an equity, health and community resilience imperative. The infrastructure and policy levers exist. Now is the time to act.



Recommendations

Recommendation 1



ECEC system reform should be guided by a clear, evidence-based prioritisation framework, embedded in state and territory planning instruments, to direct investment to underserved communities and high climate-risk regions where the cost of delivering resilient, high-quality ECEC is higher.

Recommendation 2



The Commonwealth Government should adopt a future ECEC funding model which factors in weighting for services, recognising the higher running or adaptation costs for services in underserved communities and high climate-risk areas, and supporting sustainable service delivery.

Recommendation 3



Create incentives for rollout of solar, battery and energy efficient upgrades for not-for-profit early childhood centres to reduce carbon dependence, lower running costs and maintain operations during climate events.

Recommendation 4



Develop nationally endorsed design blueprints for climate-adaptive ECEC services and expand NEMA's risk-reduction library to cover ECEC buildings. BEEF funding provides a unique opportunity for new services to showcase best practice, adaptive design.

Recommendation 5



The Department of Education should provide nationally consistent guidance, tools and training to help ECEC services operate sustainably and build educator capability to embed sustainability, climate awareness and age-appropriate climate learning.

Recommendation 6



That Commonwealth and State Governments adopt a more systemic approach to disaster management, including investment in ECEC workforce support and guidelines to enable services to manage disasters and return to operations as soon as safely possible post disaster.

Introduction



Early Childhood Education and Care services provide stable, supportive environments for children to learn, develop, and thrive. Climate change is increasingly disrupting children's learning, with extreme weather and more frequent and severe environmental hazards affecting the physical and social infrastructure that underpins ECEC. With the right investment in climate resilient in ECEC we can protect children's learning and support their development.

Given the significant, positive investment in ECEC infrastructure underway across the country through the Federal Government's Building Early Education Fund (BEEF), there is a timely opportunity to embed resilience. Now is the time to ensure ECEC services are future-ready and support our children to grow up in a more resilient, prosperous and sustainable future.

Early childhood education plays an important role in supporting our children's development by helping them to learn, build physical skills, and strengthen their social and emotional wellbeing. Participation in early childhood education is strongly linked to improved learning, wellbeing, and life outcomes.

However, climate change, and the increasing frequency and severity of climate-related hazards, are changing the way ECEC services operate and disrupting service delivery across Australia. This has increasing implications for children's development.



As this report highlights, in 2025:

Around one in six ECEC services in Australia experienced closures related to climate events (bushfires, floods and cyclones)

↳ This resulted in 11,000 days of service closures

↳ And contributed to around 800,000 days of learning lost for our children.

Early childhood is a period when development is highly responsive to environmental conditions. Stable, safe and supportive environments are particularly important during these years, meaning disruptions to care and learning can have compounding effects over time.

Children under the age of five are disproportionately affected by climate events because their bodies and brains are still developing, and they rely on adults and services to keep them safe. Children's experiences with climate related weather patterns and hazards in early childhood can have lifelong and intergenerational impacts (Frameworks, 2026).





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Climate change widens existing inequalities and undermines efforts to close developmental gaps (Frameworks, 2026).

Children living in rural and remote communities, for example:

- are more often and more severely impacted by climate events (Perry et al, 2024)
- have less capacity to be resilient in the face of climate events (Perry et al, 2024)
- are more likely to be underserved by ECEC services (Hurley, 2024)

Despite these risks, current ECEC infrastructure and policy settings are not consistently designed to support resilience to climate change or emergencies. ECEC services operate across a fragmented operations and infrastructure landscape. Buildings are owned by landlords, private providers, not-for-profits, councils and governments. That fragmentation creates a genuine challenge, as the actors most likely to bear the cost of installation - ECEC services - often lack the long term leases needed to secure a return on investment of time.

Many ECEC services were not designed for current or future climate conditions, and there is limited coordinated guidance or support to enable adaptation at scale. This increases children's exposure to climate impacts and constrains the ability of services to respond effectively.

However, ECEC services are a critical part of the system that can provide stable environments for children to learn and thrive, even in the face of increasing climate disruption. They can play a vital role in supporting children's climate resilience, including by:

- ① Providing safe, accessible and stable environments in a changing climate and with increasingly frequent and severe climate hazards
- ② Educating children on the environment and sustainability. This also helps to ensure the future generation is climate aware and equipped to lead climate change initiatives
- ③ Building children's resilience including through knowledge, inclusive disaster planning, and social and emotional learning, before, during and after climate events

- ④ Supporting families and communities after disasters, including linking to other support services

This paper is the first in a series of deep dives into the findings of the State of Australia's Children Report. It expands on the report's exploration of the impact of climate change on children and young people by looking at the role physical and social infrastructure can play in strengthening the resilience of early childhood education settings.

Drawing on literature, data and case studies from across the climate, disaster resilience, infrastructure and early childhood education domains, this report provides us with clearer insights on climate resilience in ECEC. It identifies opportunities to strengthen systems to improve resilience in early childhood, supporting children, families and communities to thrive in a changing climate.





CASE STUDY

Children's views on the environment and their wellbeing

As part of wider consultations for the State of Australia's Children Report, children aged three to four were consulted on a range of topics including where they feel safe and what helps them when they feel worried.

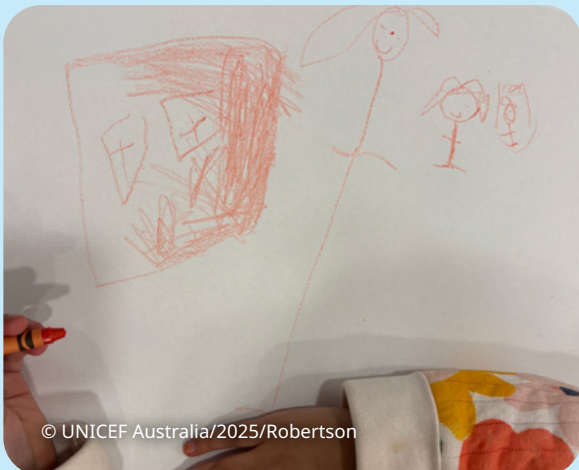
The importance of outdoor spaces and natural environments for children's wellbeing was evident. Some children mentioned outdoor spaces like parks helping them feel safe or less worried.

“Playing in the park [makes me feel better if I have a worry].”

(STATE OF AUSTRALIA'S CHILDREN WORKSHOP PARTICIPANT, AGED 3-4 YEARS)

“I feel happy at the park.”

(STATE OF AUSTRALIA'S CHILDREN WORKSHOP PARTICIPANT, AGED 3-4 YEARS).



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Children were also asked to draw or create an outdoor play space and describe it. They drew or created local parks, playgrounds and their backyards, paying attention to details like trees, grass and rocks.

One participant shared:

“I feel like I'm so happy when I'm in this [outdoor] place.”

(STATE OF AUSTRALIA'S CHILDREN WORKSHOP PARTICIPANT, AGED 3-4 YEARS)

This consultation took place in partnership with the Young and Resilient Centre at Western Sydney University. For more information about this consultation, please see the State of Australia's Children report.



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Key statistics about children and climate change

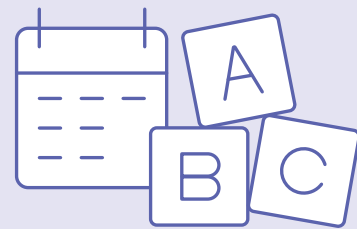


Every child across Australia is already **impacted by climate change**

(Deloitte Access Economics and UNICEF Australia, 2025)

In 2025 children aged 0-5 **missed out on around 800,000 days of early learning** due to climate events

(UWA Atlas data based on ACECQA unpublished)

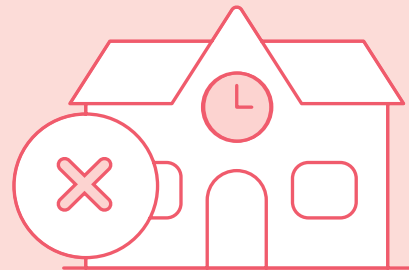


Around **1 in 6 children and young people** are impacted by disasters each year

(Deloitte Access Economics and UNICEF Australia, 2025 in O'Connell, M et al, 2025)

Around **one in six early childhood education services (2,087) experienced closures** related to climate events in 2025

(UWA Atlas data based on ACECQA unpublished)



By 2050, every child could be subject to **more than 4.5 heatwaves a year** and 10% of Australian children could be living in areas where severe heatwave events will occur (UNICEF, 2022)



The impacts of climate change on children's health, safety, and learning



Climate change is reshaping the environments children depend on to grow and thrive. Young children (0-5 years) are especially at risk because their bodies and brains are rapidly developing, and because they rely on stable, safe conditions provided by families, services and communities. When these systems are disrupted, the effects on children's health, learning and wellbeing can be immediate, life-long and even intergenerational (Frameworks, 2026).

Children's experiences of climate change are shaped by the climate risks in their communities and the strength of the supports, services and infrastructure available to help them respond and recover. For example, children without stable housing may find it harder to stay safe and recover from climate-related events. Some of these key impacts are discussed below.



Physical health impacts

Children's brains and bodies are developing rapidly, and climate events can have a detrimental impact on their physical health (UNICEF, 2026).

Listed below are some of the physical health impacts:

- The inhalation of smoke and poor air quality, including during and following bushfires, can seriously impact children's health. The Centre for the Developing Child found that smoke exposure can contribute to premature births and bronchial disease. It can also reduce academic performance for years after exposure. Heavier exposure produces worse outcomes. It can also cause or worsen asthma (Frameworks, 2026).
- Climate change and climate-related hazards can lead to food insecurity and malnutrition, (Deloitte Access Economics and UNICEF Australia, 2025), with impacts to physical and cognitive development.
- Climate change may increase the risk of mosquito-borne diseases in northern Australia, with implications for children's health and wellbeing. (Australian Climate Service, 2025).
- Heat can have a direct impact on children's health. Young children are less able to regulate their body temperature partly as they do not sweat as much as adults. Children with some pre-existing chronic health conditions like asthma and diabetes, face greater risk from heat stress. Similarly, lack of access to outdoor spaces, for example due to heat, can impact children's physical development including gross motor skills. Heat can also contribute to sleep loss, linked with emotional and behavioural challenges, language development (Frameworks, 2026) and an increase in obesity (Early Childhood Scientific Council on Equity and the Environment, 2023).



Mental health and wellbeing impacts

- Children aged 0-5 are in a pivotal developmental period, where their bodies are developing at a rapid rate. 90% of a child's brain development occurs in this period (The Front Project, n.d.). Climate events can have long lasting impacts on children's mental health and wellbeing. This includes acute stress reactions and difficulty coping, anxiety and post-traumatic stress (Early Childhood Scientific Council on Equity and the Environment 2023, Deloitte Access Economics and UNICEF Australia 2025, EPA 2023).
- Climate events can impact family functioning and have child protection impacts. Stressors and conditions created by climate events can also increase someone's risk of experiencing violence (Respect Victoria, 2025).
- Climate disasters can also impact educator mental health, as educators are often personally impacted by local disasters whilst also providing emotional support to children and families.





Learning outcomes

- Exposure to climate events can have immediate and delayed impacts on learning, including when children experience reduced attendance due to damaged or inaccessible infrastructure (Deloitte Access Economics and UNICEF Australia).
- Research has shown that sustained heat exposure reduces students' ability to learn and retain knowledge. With increasing incidence of extreme heat, children are less likely to be able to learn in hot classrooms. Over time this results in learning loss, including a reduction in test scores (Early Childhood Scientific Council on Equity and the Environment, 2023).
- Heat impacts are inequitable, with global evidence showing that children in lower socioeconomic areas experience greater learning losses from heat exposure and often have less access to measures that protect against overheating, such as air conditioning and other cooling infrastructure (Vasilakopoulou and Santamouris, 2025).
- Climate-related events can continue to impact children's learning 12 months after they occur. Boosting protective factors is essential to reduce these lasting impacts (Triggell, 2022).
- These same principles apply to educators. High quality education cannot occur in environments where educators do not feel safe and comfortable.

Proper siting, construction and fit out of schools and ECEC services can improve light, temperature, air quality, noise control and enhance the learning and work environment.

Climate change, climate risks and ECEC



Climate change and increasing climate risks

Australia's climate risks are predicted to increase and to change in location over the next few decades. Climate risks are determined by examining a combination of hazards, exposures, vulnerabilities and responses (Australian Climate Service, 2025). Australia's National Climate Risk Assessment (NCRA) (Australian Climate Service, 2025) projects more severe, frequent and compounding climate hazards. The geographic distribution of risks will shift and, in certain instances, expand. This means we cannot just focus on areas that are currently impacted by certain hazards.

While the NCRA does not specifically examine risks to ECEC, many of the risks and impacts identified across community, social and built environment systems are relevant to the ECEC sector. These include, for example, damage to infrastructure, disruptions to energy supply, rising repair and maintenance costs, and reduced access to affordable insurance.

The graphic from the NCRA on the next page shows the diversity of climate risks across the country, which may impact early childhood education services such as:

- ① More extreme temperatures around the country, with severe and extreme heatwave events projected to double if global warming reaches +2°C and quadruple if +3°C.
- ② Sea levels rises, with median projections suggesting sea levels could rise by half a metre by the end of the century. Changes to rainfall could also see increased coastal flooding. These could damage ECEC infrastructure and disrupt access.
- ③ More frequent days of dangerous fire weather expected in southern and eastern Australia, while northern regions may become more vulnerable to savannah fires which could lead to more ECEC service closures and reduced access for children and families.

Climate risks are higher in northern, coastal, remote and regional areas of Australia (Australian Climate Service, 2025).

The assessment notes critical infrastructure and essential services may come under increasing pressure from extreme weather events, and climate-informed urban planning and infrastructure investment is essential (Australian Climate Service, 2025).

The scale of impact on ECEC services

The increased frequency and severity of climate-related events are having a significant, immediate impact on children's access to education and care, and this impact is likely to continue.

In 2025, children in Australia missed out on **nearly 800,000 days of learning in early childhood and care** due to service closures caused by climate-related events (floods, cyclones and bushfires)¹.

This figure is an underestimate. It excludes children kept home by flooded roads, housing damage, displacement, or climate-related illness.

It also excludes the impacts of heat, which can reduce children's ability to learn even when they are at an ECEC service.

The impacts of climate change on early childhood education and care are being felt in communities across Australia: one in six ECEC services closed at some time in 2025 due to bushfires, cyclones or flooding. These services closed up to 11,000 days in total.

Most impacted services were closed for five days, but some were closed for far longer, causing prolonged disruption for children, families and communities.

Yet these losses are not inevitable. Climate resilient ECEC can help to ensure ECEC buildings can withstand climate hazards, recover quickly, and minimise disruptions.

¹ Drawing on Australian Children's Education and Care Quality Authority (ACECQA) data (ACECQA Unpublished) on service closures due to climate events, we can calculate how many days of learning were lost in early childhood education and care in 2025 due to bushfires, floods and cyclones. By multiplying the number of days each service was closed by the number of places per service, we can estimate that in 2025 young children in Australia missed out on nearly 800,000 (795,835) days of learning in early childhood and care due to climate events.

Regional insights

This map from Australia's National Climate Risk Assessment illustrates examples of the climate risks and impacts across Australia.



Increases in extreme heat and heatwaves will increase health risks and heat-related mortality, making it harder to work outdoors and respond to disasters.



The risk of vector-borne diseases (e.g. malaria and dengue fever) will rise as temperatures, rainfall, and floods increase, straining the healthcare system.



Crop yields will decrease with more drought (e.g. southwest Western Australia) and increased susceptibility to fire (e.g. southern and eastern Australia).



Disruptions to supply chains from more severe rainfall and flood events can result in many regional and remote communities not receiving goods. Distribution costs will also increase, particularly the cost of transporting medicines.



Many ecosystems, such as Eucalypt woodlands, will have a lower capacity to support biodiversity under future climate change.



Sea level rise and increased coastal hazards will significantly impact coastal communities and cities.



Coral reefs (e.g. the Great Barrier Reef and Ningaloo reef) will face ever increasing risks of bleaching and biodiversity loss as oceans warm and acidity increases.



Changes to the East Australian Current will cause increased 'tropicalisation', bringing more warm water southwards, and increasing risks to temperate ecosystems along southeast coastal regions.



Water availability and accessibility for towns, ecosystems and agriculture may become limited due to rising evapotranspiration in inland regions and changes in annual rainfall.



Critical infrastructure, such as power lines and telecommunications, is likely to experience increased pressure and damage from increased climate hazards.

Types of hazards disrupting ECEC services

The graphic below categorises services by their primary reason for closure in 2025. This data is significant as it shows different adaptation responses may be needed for ECEC services facing different hazards as part of a national commitment to reducing exposure and vulnerability to hazards.

Around 30 services experienced multiple closures, most commonly due to floods and cyclones. As some closures were caused by concurrent events, the individual events do not add up to the total number of closures.

While individual service closures cannot always be directly attributed to climate change, they are occurring in the context of more frequent and severe climate-related events.



Bushfire

Services closed 47 days
Nearly 2,000 (1,972) days of learning lost for children



Flooding

Services closed 3,031 days
Nearly 190,000 (183,948) days of learning lost for children



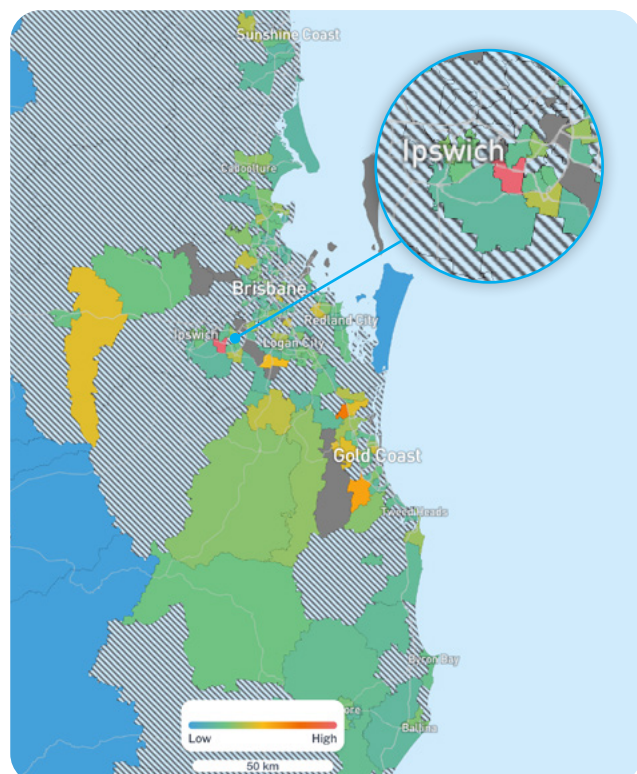
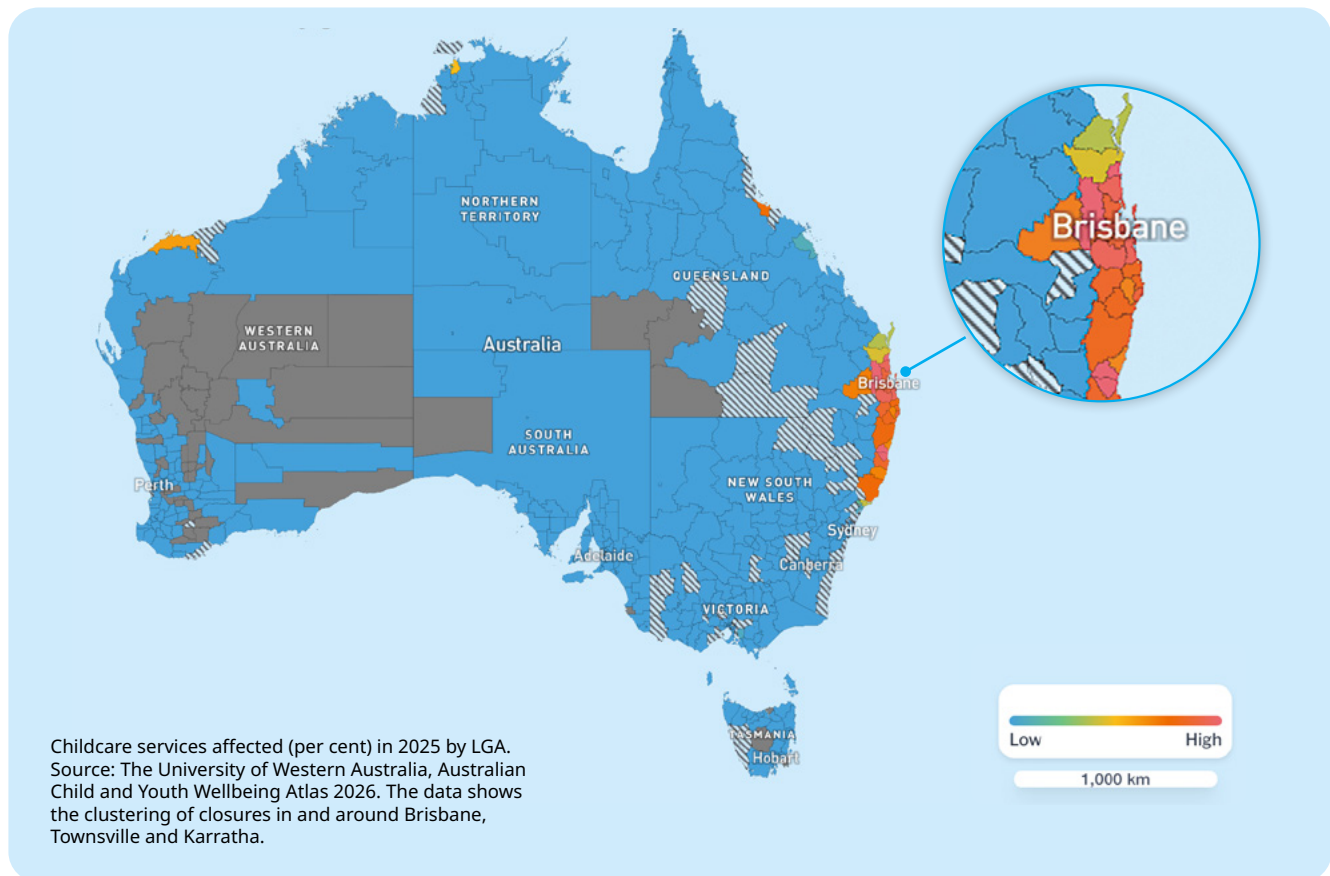
Cyclone

Services closed for 7,860 days
Over 615,000 (615,557) days of learning lost for children

Location of closures disrupting ECEC services

The impact of these hazards and ECEC closures are inequitable, with some children experiencing multiple closures in 2025. Children in Queensland were disproportionately affected, with closures driven mainly by cyclones and related flooding. This included ex-Tropical Cyclone Alfred, which saw widespread closures over several days in south-east Queensland in March 2025

State/Territory	Sum of days of learning lost	Percentage of services closed
ACT	38	<1%
NSW	91,976	7%
NT	3,619	18%
QLD	687,157	7%
SA	4,263	1%
TAS	100	1%
VIC	5,414	1%
WA	3,268	2%
TOTAL	795,835	-



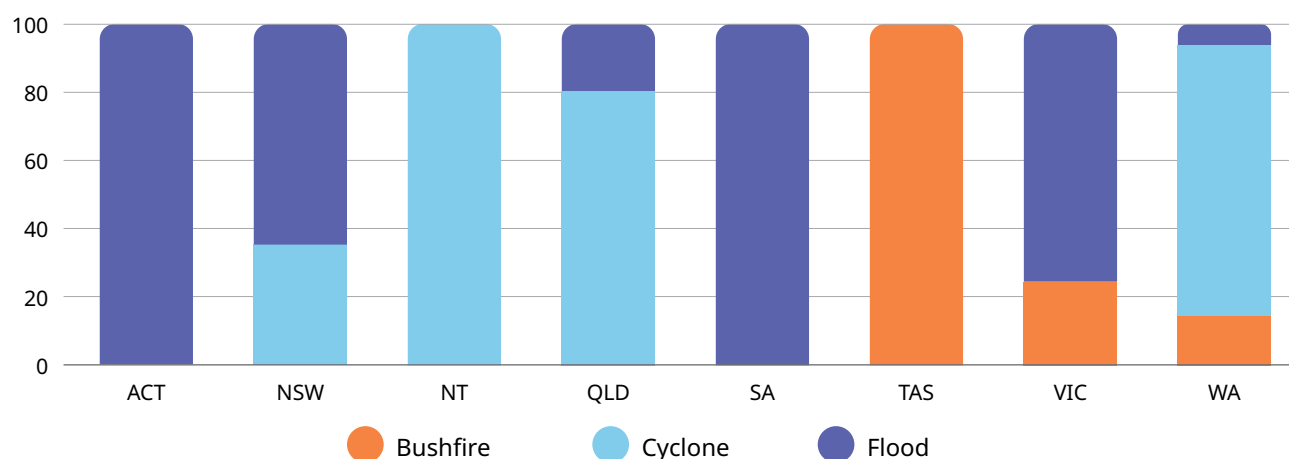
The Australian Child and Youth Wellbeing Atlas (ACYWA) has mapped a range of data pertaining to service closures due to climate events, which enable us to visualise the impact of service closures on children's learning in 2025.

The map above shows the percentage of early childhood services closed in 2025 due to climate events, mapped by local government area. The areas in pink represent local government areas where a high proportion of ECEC places were unavailable due to service closures in 2025.

The maps also help us visualise the number of closure days by location. For example, the map on the left shows that some areas such as Redback and Upper Coomera experienced hundreds of days of service closures (orange and pink shading), whilst most areas experienced 20-40 days of service closures in 2025, as shown in green.

The graph below shows the types of climate hazards impacted closures by state.

Climate events (% of state total by type)



These can also be examined spatially on the ACYWA.

These figures are all based on 2025 data. Different climate events impact Australia depending on the year. For example, as mentioned above, ex-Tropical Cyclone Alfred will have impacted the concentration of closures in south-east Queensland in 2025. Regardless of this, the increased frequency and intensity of climate hazards mean we will likely see the impacts worsen over time unless we invest in adaptation.

To explore this data in more detail, see [The Child and Youth Wellbeing Atlas here.](#)



What service closures mean to children and families

Service closures can have significant impacts on children and families.

Early childhood is the peak developmental period for children, so service closures can impact children's development - limiting opportunities for social interaction, learning and developing fine and gross motor skills. This is especially true for lengthy closures, and for families and children who are already facing additional barriers to accessing services.

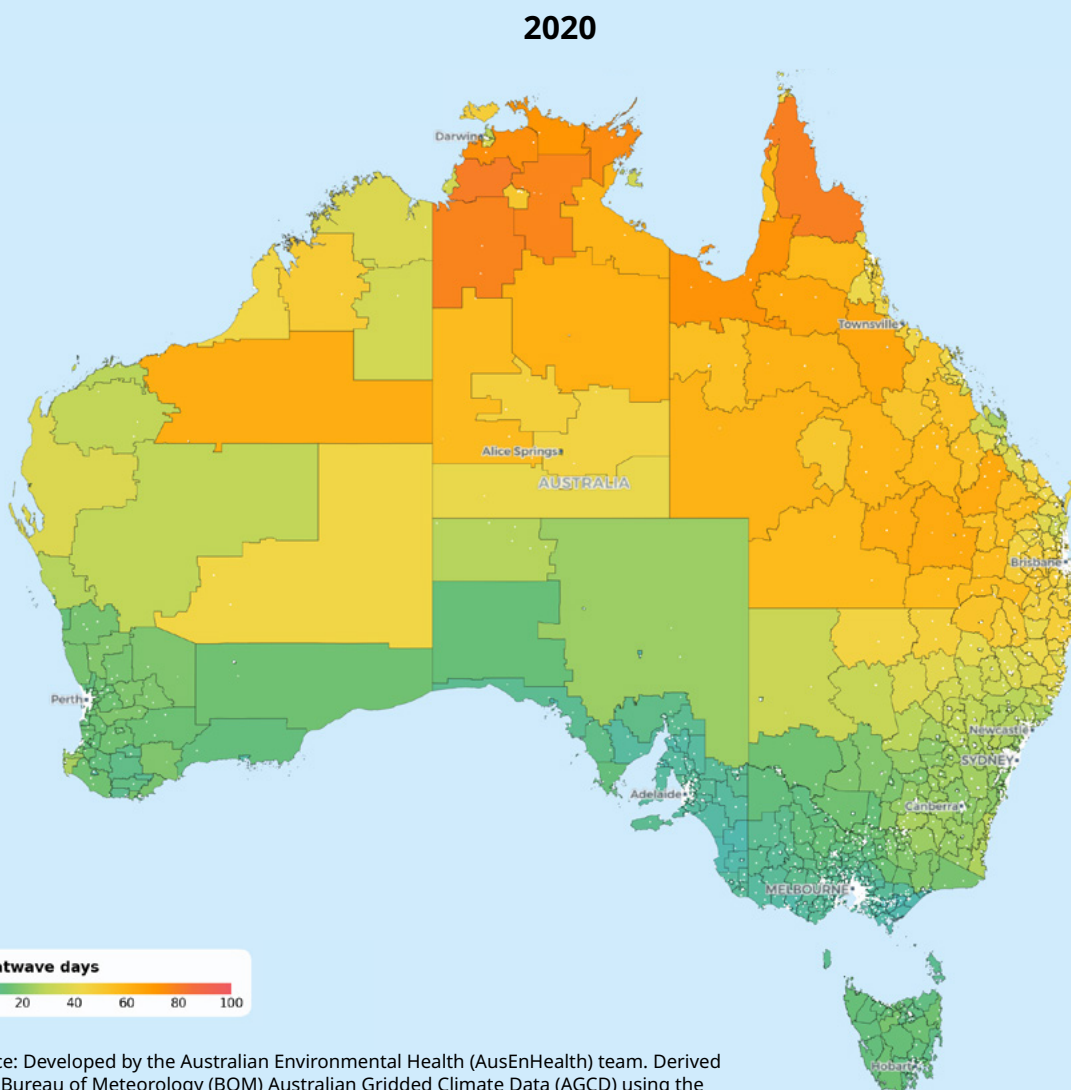
Early childhood education services are key community infrastructure, as is shown in examples that follow. They provide access to a stable environment with trusted staff and known routines for children during and after hazards, and a safe space for children to process their feelings and experiences of a hazard. In doing so, they support children's emotional wellbeing and mental health, and at times are also the source of material basics such as food and clothing.

Families affected by climate hazards can also rely on services to provide continuity of care, enabling them to access support, return to work, and participate in community recovery efforts.

The impact of heatwaves on early childhood education and care

In addition to the sudden onset climate hazards that can cause service closure, there are a range of other climate impacts that can affect children's capacity to play and learn.

For example, the map below shows heatwave data (2020), with early childhood education services shown by the white dots. The map shows the concentration of early childhood education and care services in northern New South Wales and Queensland, areas which experienced high heatwaves.

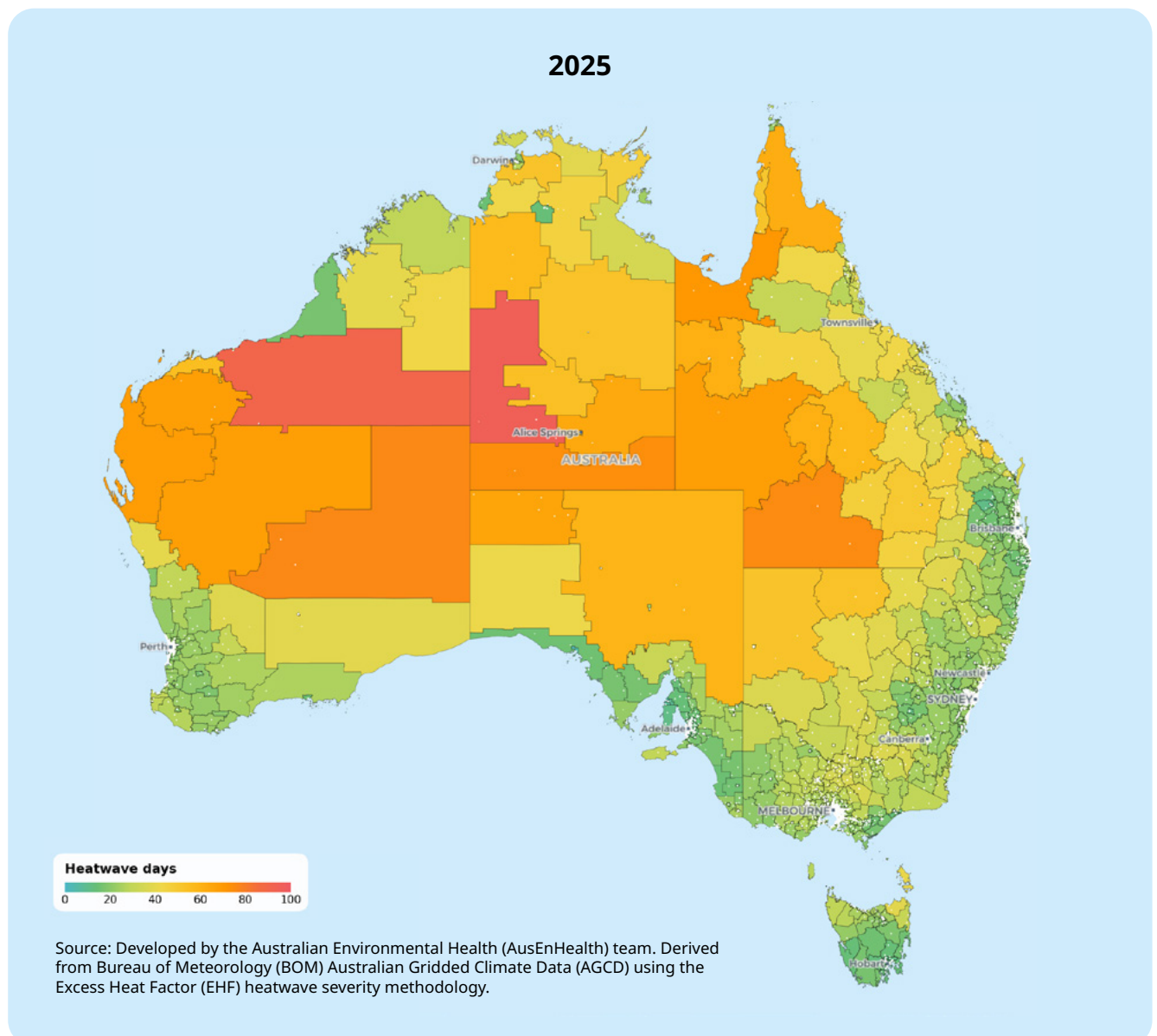


Patterns of heatwave change year on year, and the data below shows the different pattern of heatwaves from 2020 to 2025. The lighter the colour the more heatwaves experienced, with southern states experiencing more heatwaves in 2025 and into 2026.

Evidence shows that children in areas less accustomed to heatwaves experience poorer long-term educational outcomes when faced with extreme heat (Vasilakopoulou, 2026). As heatwaves become more widespread, children in areas where heatwaves have been less frequent in the past may be disproportionately affected,

as local systems, services and infrastructure are less adapted.

Research with school aged children suggests they can find it harder to concentrate, participate, and learn during hot weather, particularly when classrooms become uncomfortably warm and schools lack access to cool, shaded outdoor areas. However, building design, site selection and other infrastructure can reduce these risks as will be discussed later. Climate risks and population vulnerabilities need to be taken into account when planning adaptation interventions for ECEC.



Climate resilient ECEC infrastructure



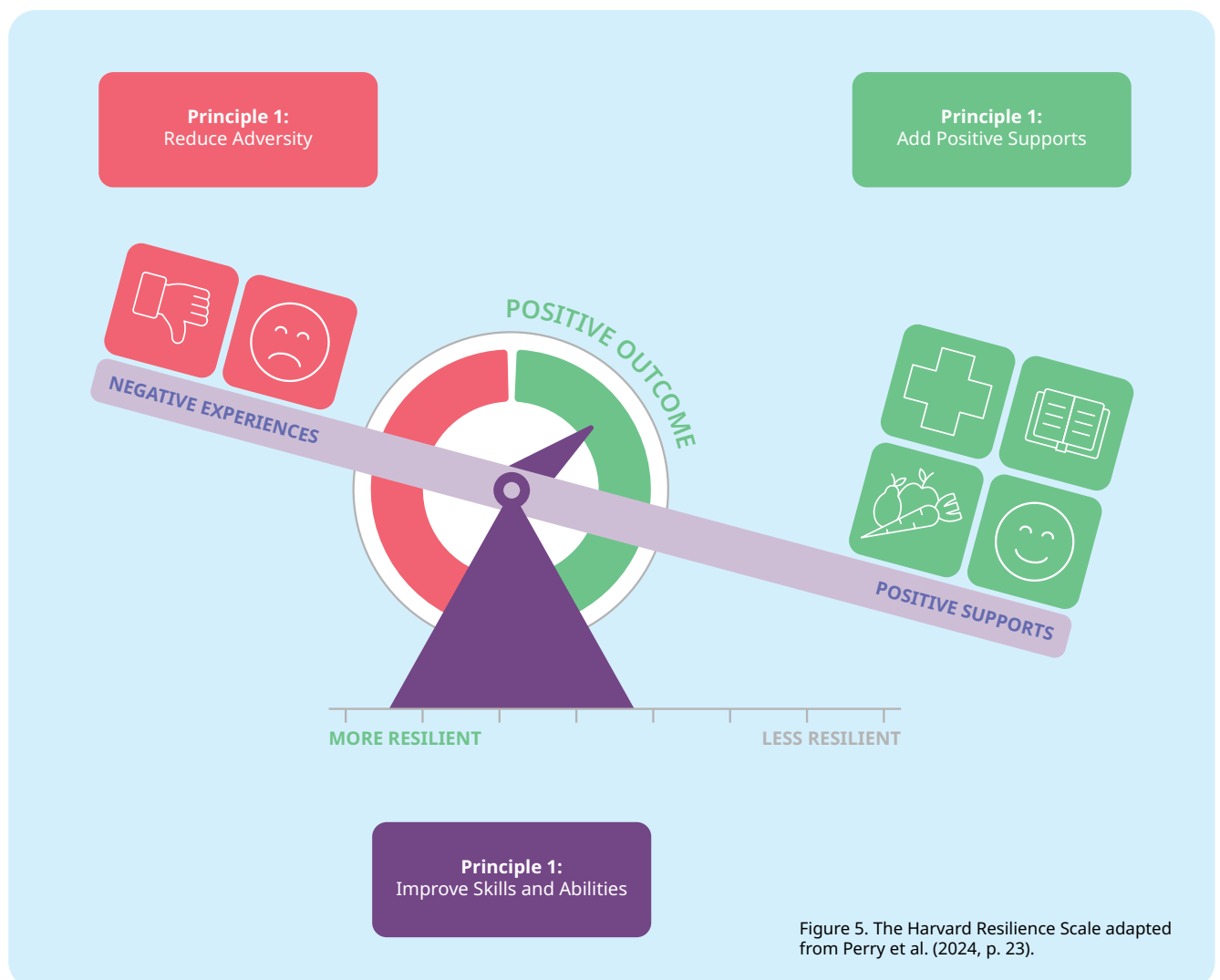
In this section, we explore the role of both climate resilient physical infrastructure, including buildings and the natural environment, and climate resilient social infrastructure, including the role of educators, in building climate resilience. We examine how climate resilience can support children's capacity to cope with and adapt to climate change, as well as their overall resilience and wellbeing.

Climate resilience is closely linked to overall child resilience. The Harvard resilience scale shows child development as a balance between risks and supports. Stress and adversity sink outcomes downwards, while things like family support lift them up. Over time, children exposed to more adversity become more sensitive to new shocks. Building resilience means reducing risks, building

skills, and strengthening supports (National Scientific Council on the Developing Child, 2015).

Similarly, whilst climate events can adversely impact child development, climate resilience can enhance children's capacity to understand, withstand and recover from climate events and disasters.

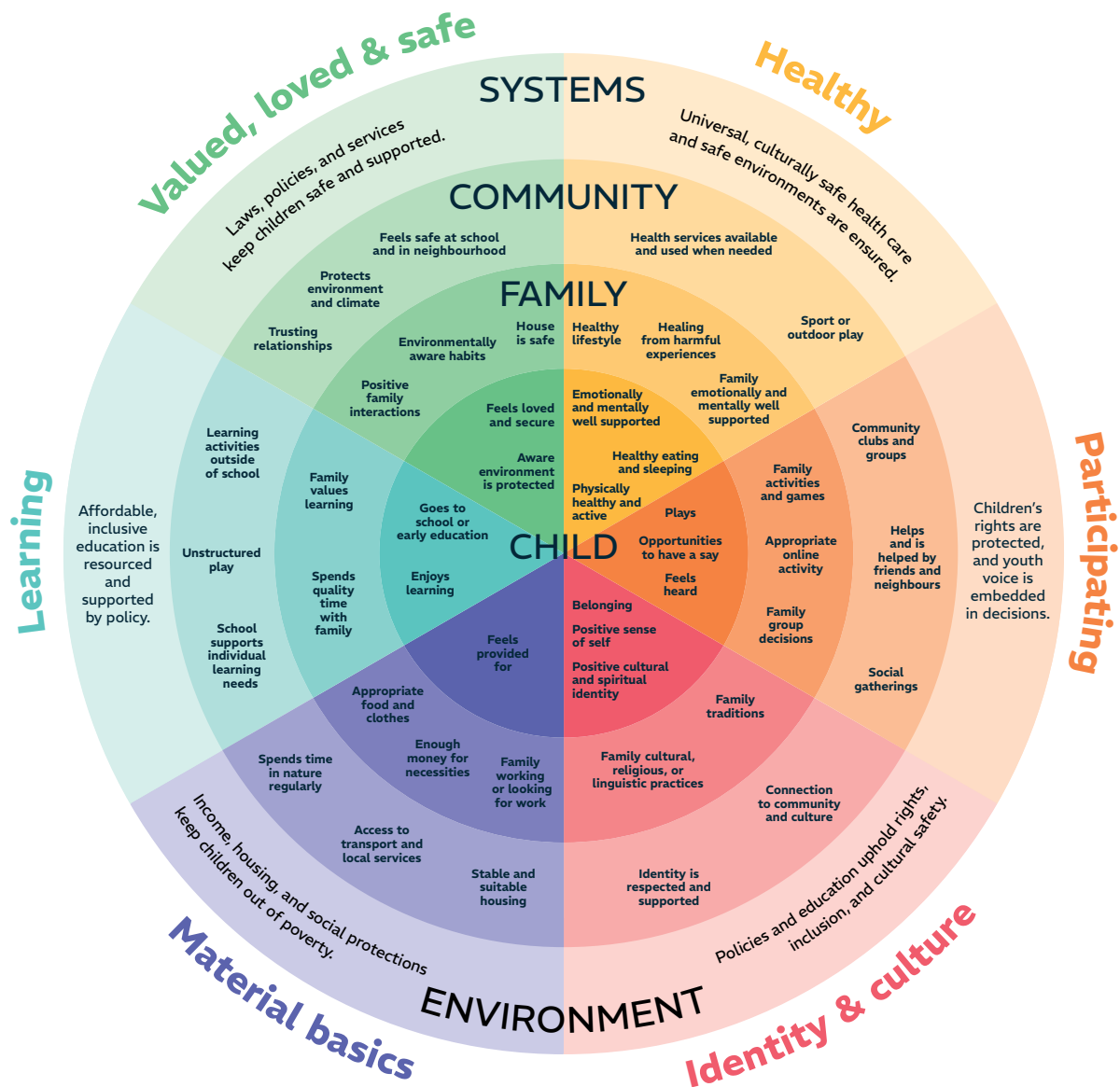
Climate resilience can include things like safe and comfortable spaces, supportive environments and networks and age-appropriate information. It also includes supporting children on how to respond during climate hazards (Sanson, 2020 and Towers, 2020). Child-centred approaches to disaster risk reduction also support children to take a role in preparing and responding to disaster risks (Towers 2020).



Child wellbeing and The Nest

Children's capacity to grow and thrive is impacted by a myriad of factors. This is depicted in the ARACY Wellbeing Wheel below which builds upon The Nest, Australia's framework for child and youth wellbeing. It shows a sample of wellbeing initiatives and supports mapped across

domains – for example the role of early childhood education supporting learning. Climate hazards can impact many of these factors at the family, community and system level. Appendix 1 provides detail on the impacts of climate change on children's wellbeing - mapped to the ARACY Nest domains and UN Convention on the Rights of the Child - and explores how physical and social infrastructure can support resilience.



The role of physical infrastructure

Physical infrastructure includes buildings and their surrounds. It plays a key role in climate resilience and supporting children across a range of domains of The Nest including learning and health. This section outlines practical approaches, and provides examples, that can support ECEC services to adapt to the impacts of climate change and extreme weather events, ensuring continuity of care and safe, supportive environments for children.



CASE STUDY

Services can engage directly in mitigation and resilience initiatives, like maximising solar energy and natural materials or promoting biodiversity and natural ecosystems.

For example, a study in Leipzig, Germany found significant use of small-scale green infrastructure elements, including greening grey surfaces through vertical walls, vegetable gardens and plant labelling, enabled child

learning and exposure to biodiversity. It also found significant opportunity to improve the heat resilience of kindergartens through more consistent oversight of kindergartens as part of local green infrastructure and the adoption of consistent approaches including on biodiversity, stormwater management, rainwater harvesting and permeable surfaces (Haase, D. & Dushkova, D. 2025).



Climate resilient infrastructure can sometimes both support services' ability to adapt to the impacts of climate change and help reduce emissions (mitigation). For example, Parents for Climate are advocating for solar panels and batteries for every Australian school and early childhood service. Solar not only reduces emissions but can support services to operate during power outages which are projected to occur more frequently during climate events like heatwaves.

There has been some investment in solar in schools across Australia. However investment in solar in ECEC lags behind and is a missed opportunity to create sustainable energy, improve equity (as small centres are the least

likely to be able to afford to retrofit) and to reduce ECEC running costs by up to \$100 million (Parents for Climate, 2024).

With ECECs having diverse ownership and operation models, with buildings owned by landlords, private providers, not-for-profit, council and government, there are cases where the beneficiary of retrofitting is separated from the person likely to bear the cost. Parents for Climate (2024) provides an example of how this has been addressed in op shops which operate on a lease arrangement, with a range of options for end of lease including landlords buying the solar panels or the renting organisation moving them to an alternative site.



The Policy Context

The National Quality Framework (NQF) is the national system for the regulation and quality assessment of early learning services. Quality Area 3 under the NQF is the Physical Environment, and standards include a focus on design being fit for purpose, and on environmental responsibility. While these standards support high-quality design, they do not explicitly require services to consider climate risk or incorporate climate-resilient infrastructure.

Children are also not a focus of national climate change adaptation plans nor is education included as a focus area. This is a missed opportunity, especially given the key role education can play in supporting children to learn about climate change and develop green skills for the future.

Australia's National Adaptation Plan (Department of Climate Change, Energy, the Environment and Water 2025) provides a strong foundation for managing climate risks. Strengthening it to

include targeted measures for children and education systems would help protect our most important infrastructure for the future.

By contrast Victoria has an Education and Training Climate Change Adaptation Action Plan, which includes a focus on emergency management, sustainability curriculum, emissions reductions and adaptations in early childhood education (Department of Education and Training 2022). Other states integrate education into their broader adaptation plans.

Infrastructure Solutions

Resilient physical infrastructure in early childhood education can look different depending on the climate impacts and hazards facing a location. Improving the resilience of infrastructure can vary in scale, from re-building a service to withstand floods, to resurfacing a playground or installing solar-powered air conditioning. We provide some case studies below, and a list of social infrastructure considerations can be found in Appendix 1.



Minimising the effects of extreme heat by adapting early childhood infrastructure

There are a range of practical solutions that can be adopted in early childhood education and care settings to help them adapt to climate change. Adaptive measures for heatwaves provide one example.

Heatwaves are increasing in incidence and severity and have a higher death rate than all other natural hazards.

There are a range of solutions that can support children to thrive in periods of high heat. Early childhood education and care services play a key role given that nearly half of all one-year-olds attend early childhood education and care, and this rises to around 90% of children attending preschool in the year before school (Productivity Commission 2026). These children attend ECEC during the hottest parts of the day, so their exposure is potentially high.



Key strategies related to physical infrastructure that can be employed include:

Reducing radiant heat and improving structural cooling:

This includes:

- ① Integrating native canopy trees to create natural shade, vegetation to decrease air temperatures and permeable paving to manage rainfall
- ② Reducing radiant heat through design and shade, including considering cool surface materials. For example, artificial grass becomes hotter than other surface materials (Pfautsch et al., 2020).
- ③ Improving classroom insulation and ventilation to improve air flow and protect against extreme temperatures

Installing cooling systems:

The need for air conditioning systems is increasing across the country, with areas previously unlikely to experience extreme heat suffering heatwaves. Air-conditioned early childhood education and care services can support continuity of education for children and depending on their structure as community hubs, support broader community access including for pregnant women who can experience ill health effects, such as premature birth, from extreme heat.

Improving air quality:

Air filtration can help protect children from smoke and pollution, including during heatwaves.

Provide reliable access to the power grid:

Air conditioning can be unreliable during heatwaves as excess drain on power can



cause power outages. Providing cost effective backup access to the power grid, for example installing solar panels and battery storage, can support services to operate during power outages, including during heatwaves, storms and post disasters.

Water harvesting:

Supporting collection of rainwater can assist continued irrigation during heatwaves and drought and support access to water. (Pfautsch et al., 2020).

Behavioural strategies:

This is in addition to behavioural strategies, such as drinking water regularly, staying in shaded or cool areas, wearing lightweight clothing and using wet clothes or other cooling measures to keep children cool and hydrated (Early Childhood Scientific Council on Equity and the Environment, 2023).

When building new services, additional measures can be taken to avoid flood and fire zones, and to maximise ventilation and passive cooling (Department of Education and Training 2022).

There are a range of examples of adaptation in ECEC in Australia, with the below example showing how build quality can enhance sustainability and increase climate resilience.



CASE STUDY

A long daycare service in Canberra shows that it is possible to build a high quality, energy efficient building that saves on electricity usage and provides a more comfortable learning environment for children and educators.

The Torrens Early Learning Centre is a daycare and kindergarten facility in Canberra, that is built according to German Passivhaus standards. Passivhaus buildings utilise a combination of airtight construction, mechanical ventilation and carefully chosen insulation to keep their energy use extremely low, and are assessed against rigorous standards (Weiner, S., 2020).

Although the build cost for the service was at a premium, the benefits are immense. The filtration system means there are no temperature fluctuations, buildings are quieter and children are less likely to experience allergies or asthma. This was particularly important during the Canberra bushfires where poor air quality impacted



children's capacity to engage in education (Weiner, S., 2020). Air quality at the service remained of a high standard, providing a protective environment to the children in attendance.

The service has a smaller environmental footprint than other buildings due to its thermal efficiency, with electricity costs of \$36 per year, well below the \$15,000 a year for other buildings owned by the service owner (Australian Passivhaus Association 2026).

Queensland is establishing a flood resilient schools program to ensure that children can continue in education soon after a flooding event and to reduce the cost of rebuilding using resilient materials below areas of flood risk. These buildings enable water to flow through them. A cost-benefit analysis shows that the higher upfront cost of flood-resilient construction is outweighed by the benefits, including lower rebuilding costs, fewer disruptions to learning, and reduced social and emotional impacts on children when there is a

1% annual chance of flooding (Frontier Economics, 2025).

Our understanding of how the environment impacts children's learning is still building. The Building Futures project at the University of Queensland is investigating the impact of ECEC locations and physical environments on children's development and learning with the aim of producing evidence-based guidelines for physical environments.

Key recommendations for physical infrastructure

A focus on climate resilient and adaptive physical infrastructure is important to ensure all children can attend early childhood education and care. The following recommendations would strengthen the capacity of the early childhood education and care system and are designed to be practical and implementable within the existing policy landscape.

Recommendation 1



ECEC system reform should be guided by a clear, evidence-based prioritisation framework, embedded in state and territory planning instruments, to direct investment to underserved communities and high climate-risk regions where the cost of delivering resilient, high-quality ECEC is higher.

Recommendation 2



The Commonwealth Government should adopt a future ECEC funding model which factors in weighting for services, recognising the higher running or adaptation costs for services in underserved communities and high climate-risk areas, and supporting sustainable service delivery.

Recommendation 3



Create incentives for rollout of solar, battery and energy efficient upgrades for not-for-profit early childhood centres to reduce carbon dependence, lower running costs and maintain operations during climate events.

Recommendation 4



Develop nationally endorsed design blueprints for climate-adaptive ECEC services and expand NEMA's risk-reduction library to cover ECEC buildings. BEEF funding provides a unique opportunity for new services to showcase best practice, adaptive design.



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The role of social infrastructure

Early childhood services, as key child centred and psychologically and physically safe environments, play a key role in early childhood disaster risk reduction and keeping children safe in a changing climate (Hayden and Petal 2018).

Social infrastructure includes:

- ① Educators helping children to stay safe and supported. Children feel safe when they are connected to loved and trusted people and where they have a sense of agency. Teachers play a role in keeping children safe, calm and informed in poor weather and before during and after emergencies. The early childhood education system can assist educators to have appropriate knowledge, skills and support they need to do this, including having access to mental health and psychosocial support.
- ② Adverse weather and emergency procedures help to ensure educators and centre staff know what they need to do to keep children safe and well in poor weather or hazards. This could include things like processes for keeping children cool in extreme heat and heatwaves, or evacuation and parent notification procedures in emergencies.
- ③ Disaster response and recovery. ECEC can provide a safe, stable environment to support children to reflect on disaster experiences and reduce the impact of trauma. ECEC centres can also link families to wrap around supports, provide care to children so parents can return to work, and offer safe, familiar stable and comfortable places for children when their lives are otherwise disrupted and uncertain following a disaster.
- ④ Children also play a critical role in their own resilience to climate change, with education and learning about the environment, climate and hazards playing an important role.



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This section outlines practical social infrastructure approaches – and provides examples – that can help to strengthen the resilience of services.

Learning about climate and the environment

By teaching children about the natural environment, we can support them to better understand the world around them, cues for changes in weather, and how their actions affect the natural world. This not only supports their resilience but empowers them to become agents for climate action, and better stewards of the environment as they grow older.

Supporting children to learn about sustainability through the Early Years Learning Framework (EYLF)

The Early Years Learning Framework guides children's learning and development from birth to five years. In 2023 the framework was updated and following an extensive consultation, review and trial process, sustainability was included as a principle.

Sustainability in the EYLF encompasses the interrelated areas of environment, social and economic sustainability. The environmental aspect, focusing on care for the natural world and preserving and protecting the environment, aligns with a focus on climate resilience. Outcomes in the framework include that children begin to understand and use sustainable practices in their settings and communities (Australian Government Department of Education, 2022). This includes learning First Nations land care and environmental sustainability practices.



CASE STUDY

Consultation on The Early Years Learning Framework

Children's input as active and engaged citizens was sought throughout the research process to inform the updates to the EYLF, from the gathering of opinions to discussing recommendations, to seeking children's input in sixteen pilot sites.

In seeking feedback about the principle of sustainability, children were asked about caring about the planet:

- We can take care of the planet by keeping it clean and picking up rubbish and planting flowers and plants.!!

(JI-THUKI, 3-5 GROUP, TALKING CIRCLE, STAGE 2).

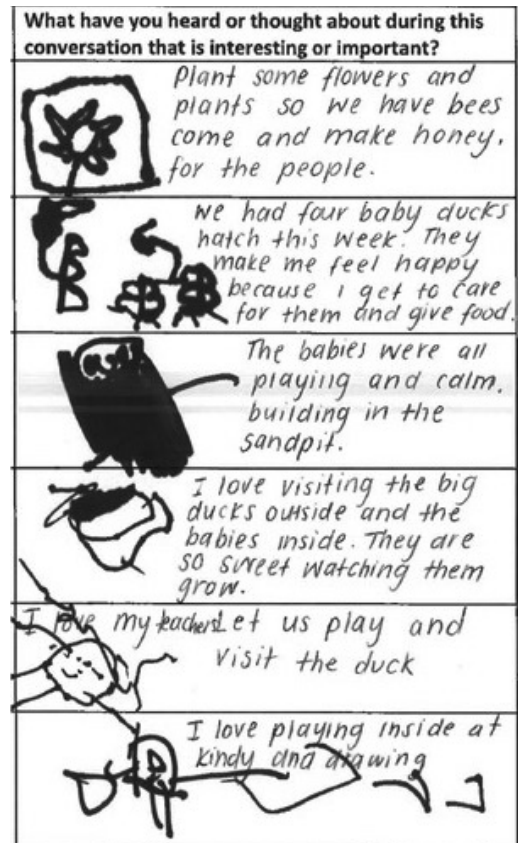
- Not putting rubbish in the ocean is important, turtles get stuck in plastic.!!

(ALBERT, 4 YEARS, TALKING CIRCLE, STAGE 2)

Another child talked and drew about recycling:

- This is me, putting the rubbish in the garbage bins. The teachers help me decide where things go.!!

(GEORGE, 4)



Children provided reflections on sustainability and how it is important to care for the land:

- picking up rubbish is good. It makes me happy.!!

(4 YEARS).

Children's drawing's show their awareness of nature, and how plants and animals play particular roles and require nurturing (Barblett et al., 2024).

Very young children drew responses that captured their environment, such as Johan's:

“Johan likes to go on walks around the garden at daycare.”

(Barblett et al, 2023)

Other young children reflected upon what they saw in nature:

“Walking around the garden; I find flowers and bugs. I like finding bugs at Leesa's house.”

(JOHN, 2 YEARS AND 4 MONTHS, TALKING CIRCLE, STAGE 2)

(Barblett et al, 2023)

Children showed their increasing knowledge and commitment to protecting the environment and engaging as active, thoughtful citizens throughout the project (Barblett et al, 2024).

Victorian government early childhood education services piloted a sustainability community of practice to integrate sustainability pedagogy to respond to National Quality Framework physical environment area. Approaches included integrating Koorie perspectives to show how all children are part of the environment and to promote respect for the environment. Through different approaches they laid the foundations of

environmental awareness in children and moved beyond traditional programmatic approaches of worm farms and recycling bins into embedding aspects of sustainability into the curriculum.

The inclusion of sustainability in the Early Years Learning Framework enhances the opportunity to draw on the rich Aboriginal and Torres Strait Islander history of knowing and caring for the land.





CASE STUDY

The Baya Gawi Early Childhood Learning Unit in Fitzroy Crossing, in the Kimberley region of Western Australia, is operated by Marninwarntikura Women's Resource Centre. Fitzroy Crossing is situated on Bunuba Country (Morphy, 2010) and there are five main Aboriginal language groups living in and around the town.

Baya Gawi uses a two-way learning model that combines cultural knowledge with Western knowledge systems to support children to walk in two worlds. Its curriculum is grounded in the seasonal calendars of three main language groups: Bunuba, Gooniyandi and Walmajarri. Educators share that this approach supports children to learn about and connect to Country, the weather and seasonal change – knowledge that is central to daily life in Fitzroy Crossing.

“So let's say I'm planning a learning experience and I want to support children to learn about numbers, I will try to incorporate elements from the calendar. If I saw in the calendar that the crocodiles are laying eggs at this time of the year, we would do an experience where we count how many eggs they have. And then we also try to include the language.”

“I think this is very meaningful because the weather actually influences so much in lives here.”

“This time now (early May), just at the end of the wet season, (there are) grasshoppers everywhere. But now the grasshoppers are finishing and the children are inquiring: ‘what happened to the grasshopper?’ There's just so much to learn and to provoke them, to explore.”

With temperatures regularly exceeding 40 degrees during the hot season (August to December according to the Bunuba Seasonal Calendar.), educators adopt a range of practices to support children's safety while enabling outdoor play. At certain times of day, children are encouraged to move between indoor and outdoor environments depending on their comfort, and educators support children to recognise and learn the signs of heat and to respond appropriately.

“We help (children) to develop that awareness (of feeling hot). Like we always say, ‘well, look at your cheeks are very red. You were sweating. Are you feeling really hot?’ ‘Oh, yes’. ‘Shall we go inside and cool down?’. And eventually they start doing that by themselves.”

“The free flow is good as well. They have this autonomy – ‘I feel like playing this thing inside now. Now I feel like running and going outside’... Some centres (in cooler locations) have policies that it's over 35 degrees, you can't go outside. And we were like, ‘if we do that, (children are) going to spend half of the year inside. Of course, we make sure we follow all the safety regulations. And one of them is checking temperatures on the surface... every hour when we are outside.”

The centre has made positive improvements to its environment including converting the sand garden into grass, planting trees and installing and repairing large shade cloths. These adaptations create cooler, more comfortable outdoor environments for children.



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Learning about disasters

Importance of child agency in planning for hazards

A key to reducing the impacts of the increasing risk and severity of climate-related hazards on children is to involve children in preparedness. In particular, the inclusion of children in age-appropriate disaster planning before, during and after disasters supports resilience (Perry, 2024; Hayden & Petal, 2018). This can build the resilience of children, as well as enhance the resilience of their communities (Treichel April, 2020).

Children can engage in a range of activities to learn about hazards, from listening to stories to role playing, engaging in nature trips, singing, stories and evacuation drills. Children can play a role in preparing for and responding to hazards

as is outlined below as well as being advocates for adoption of disaster reduction and environmental sustainability (Treichel, 2020).

Building systems to support disaster recovery

Early childhood education and care, whether in early childhood centres or in playgroups, can provide a safe, stable environment to support children and their families to reflect on their disaster experiences and reduce the impact of trauma including through reframing behavioural responses (Petriwskyj, 2013).

A systemic approach drawing on a range of social infrastructure is integral to recovery, with educators, parents and other community resources playing a key role. Resources such as Birdies Tree, Be You (including a bushfire response program) and Emerging Minds (including a community trauma toolkit and disaster practice guide) assist educators in supporting children and their families to understand disasters both before and in the recovery process.

In some communities, early childhood education services have supported families to access material basics such as food, water and shelter following a disaster. In many communities they provide a vital service so families can engage in recovery efforts and/or return to work.

Emerging evidence shows how climate change is impacting community cohesion, yet this community cohesion is critical for climate action. Social connection - supported by community infrastructure like ECECs - is critical for community responses to climate change. ECECs can play an important role as community hubs following disasters. This matters most in communities where housing is less likely to withstand climate events, where air conditioning is less available, and where families are less likely to be insured.

Early childhood education services can link families to wrap around support. Wrap-around support is more easily facilitated in integrated services and early childhood hubs.



CASE STUDIES

Helping children to recover from disasters

2022 Northern Rivers floods, Goodstart Early Learning Service, Goonellabah

Following the April 2022 Northern Rivers floods, Goodstart Goonellabah's educators supported children through a floorbook approach to document their reflections, and in doing so provided an outlet for their feelings and helped children feel more empowered by engaging in safety planning.

Educators supported children to make sense of their world, including sharing their emotions and replicating the floods through water play. This supported families who

themselves were trying to process the floods (ABC kids, n.d).

"Sometimes we underestimate children and just how resilient they are, but that resilience can only take place in a supportive, consistent and safe environment where conversations are open and children are free to explore and learn their ideas and emotions. I think that sometimes it is too hard for the family to talk about natural disasters with children as it is raw and sad and just too painful as they are processing it themselves and learning how to deal with it. That is where we as teachers and educators need to provide that space for children to learn and understand the world around them in age and developmentally-appropriate ways." (Debra Mitchell, Centre Director Goodstart Goonellabah in (ABC kids, n.d)).



Source: Goodstart Early Learning Service Goonellabah from (ABC kids, n.d) <https://www.abc.net.au/abckids/early-education/helping-hands-disaster-resilience-tool-kit/responsive-early-education-after-a-disaster-or-emergency-/103168504>

Children and their families in Cairns northern beaches area, which had been impacted by flooding post cyclone, were invited to engage in playgroups, supported by a collaboration between the Queensland Centre for Perinatal Infant Mental Health, Queensland Kids Partnership and Play Matters.

Families and children engaged in a range of activities to share their experiences, including writing notes on leaves and using them to build a turkey nest.

Children created meaning in a variety of different ways, from dress ups to drawings.



Record-breaking floods in 2023: The Baya Gawiy Early Childhood Learning Unit, Fitzroy Crossing

Less than a year later, in January 2023, the town of Fitzroy Crossing in the Kimberley region of Western Australia was devastated by record-breaking floods.

The Baya Gawiy Early Childhood Learning Unit supported children to voice their experiences of the flood to process and make sense of them. The educators supported the children to process the flood using pictures and other mediums like clay. For example, they worked with children to problem solve how the bridge could be repaired.

“We do work a lot with inquiry-based learning. We put up provocations and consider what the children have to say about them. I put pictures on the wall about the flood. These were pictures that locals shared online. I made displays. There are pictures of animals and the bridge being broken. The children would be prompted by these photos and then share,” said one Baya Gawiy early childhood educator.

Providing a space for children to talk about their experiences of disasters and their emotions in an age-appropriate way is important for children’s recovery and reducing the likelihood of long-term adverse outcomes.

These case study examples show the integral role played by educators and early childhood services to support children to learn about the environment and respond to climate hazards. A systemic approach is needed to ensure all educators and services are supported, in line with the following recommendations.

Key recommendations for social infrastructure

A focus on social infrastructure is important to ensure all children can access safe and resilient early childhood education and care. The following recommendations would strengthen the capacity of the early childhood education and care system and support educators and caregivers. These are designed to be practical and implementable within the existing policy landscape:



Recommendation 5

The Department of Education should provide nationally consistent guidance, tools and training to help ECEC services operate sustainably and build educator capability to embed sustainability, climate awareness and age-appropriate climate learning.



Recommendation 6

That Commonwealth and State Governments adopt a more systemic approach to disaster management, including investment in ECEC workforce support and guidelines to enable services to manage disasters and return to operations as soon as safely possible post disaster.

Conclusion: the pathway to building climate-resilient early learning



Early childhood is a key development period, and early childhood education and care services play a pivotal role in supporting children's learning. We can maximise our investment by ensuring all children have access to services that are appropriate and adapted for their unique environments.

The report has covered a vast landscape, examining the role of social and physical infrastructure in supporting children to learn about and respond to climate change and stay safe from hazards.

This report showcases the tremendous work occurring in early childhood education centres to support children's learning and capacity to adapt to climate change, and the opportunities to maximise outcomes through systemic approaches.

The paper highlights opportunities to support educators and centres to build and deepen

resilience practices, and to adopt more consistent disaster management approaches.

Ensuring climate resilience in existing centres is a key to access, so centres can continue operating, or return to operations, after climate events. These approaches both maximise children's learning and reduce rebuilding costs.

Now is the time to invest in climate-resilient ECEC systems. With significant and welcome national investment in supporting universal access to early childhood education, including the Australian Government's \$1 billion investment in the Building Early Education Fund, there is a clear pathway to embed climate resilience as a core design standard for new and upgraded services. Doing so can set a strong benchmark for the sector, enable children and communities to benefit from continuity of children's learning and strengthen community recovery. It can also reduce the long-term costs of inaction, particularly in communities facing higher exposure to climate risks.



Recommendations

The recommendations below are an elaboration of the recommendations contained in the main report.



Recommendation 1

ECEC system reform should be guided by a clear, evidence-based prioritisation framework, embedded in state and territory planning instruments, to direct investment to underserved communities and high climate-risk regions where the cost of delivering resilient, high-quality ECEC is higher.

This would target investment to areas where services are most at risk, ensuring centres remain open during disasters and children can continue attending early learning, leading to less disruption now and improved developmental outcomes over time.



Recommendation 2

The Commonwealth Government should adopt a future ECEC funding model which factors in weighting for services, recognising the higher running or adaptation costs for services in underserved communities and high climate-risk areas, and supporting sustainable service delivery.

This would ensure service viability for services operating in high-risk regions, ensuring children maintain access to early education during and after disasters, reducing immediate service closures and long-term learning disruption.



Recommendation 3

Create incentives for rollout of solar, battery and energy efficient upgrades for not-forprofit early childhood centres to reduce carbon dependence, lower running costs and maintain operations during climate events.

This would reduce emissions and strengthen physical infrastructure so services are safer and more resilient during climate events, improving continuity of care now and reduce recovery time and costs after disasters.



Recommendation 4

Develop nationally endorsed design blueprints for climate-adaptive ECEC services and expand NEMA's risk-reduction library to cover ECEC buildings. BEEF funding provides a unique opportunity for new services to showcase best practice, adaptive design.

This would enable new builds to be climate resilient by providing clear guidance on what a climate-resilient ECEC service looks like in practice.



Recommendation 5

The Department of Education should provide nationally consistent guidance, tools and training to help ECEC services operate sustainably and build educator capability to embed sustainability, climate awareness and age-appropriate climate learning.

This would support services to educate all children about sustainability, enhancing their knowledge of sustainable practices and capacity to be future change agents.



Recommendation 6

That Commonwealth and State Governments adopt a more systemic approach to disaster management, including investment in ECEC workforce support and guidelines to enable services to manage disasters and return to operations as soon as safely possible post disaster.

This would support children to remain safe during disasters, increase their agency and ability to respond, and reduce the ongoing impacts on them and their educators, including supporting a continuity of learning.

Throughout this report there are examples of early childhood education services educating children about the environment and supporting children and their families to respond to climate events. Our final case study showcases methods that can be adopted by educators to support children to engage with complex environmental concepts.



CASE STUDY

Listening to children to shape landcare and climate learning in early childhood

Authors: Dr Jacqueline Ding, Ms Alice Ghazarian

This case study draws on the *Voice of the Child* project at a metropolitan early childhood education and care service in Victoria. The project is being run by the Centre for Community Child Health at the Murdoch Children's Research Institute. The project piloted creative, child-centred methods to understand how children aged 3–5 years conceptualise nature, care, and their role in the environment.

Methods included Polyglot Theatre's signature creative activities – Voice Lab (Figure 1), collaborative “Paper & Tape” world-building, and shared “Big Draw” drawing.

Across activities, children expressed a strong affinity for being outdoors. Many children identified outdoor environments, such as the garden, park, or beach, as their preferred play spaces. Almost all children linked playing outside with happiness. One child characterised being outside as opportunity to

“play and learn stuff.”

These findings suggest the importance of access to natural environments as a foundation for children's wellbeing, development, and early environmental learning.

Children demonstrated emerging ecological understanding and “green skills”. Many articulated that plants require sun and water to grow and recognised the role of nature in sustaining human life. As one child explained,

“because if they don't have any water then the plants won't grow.”

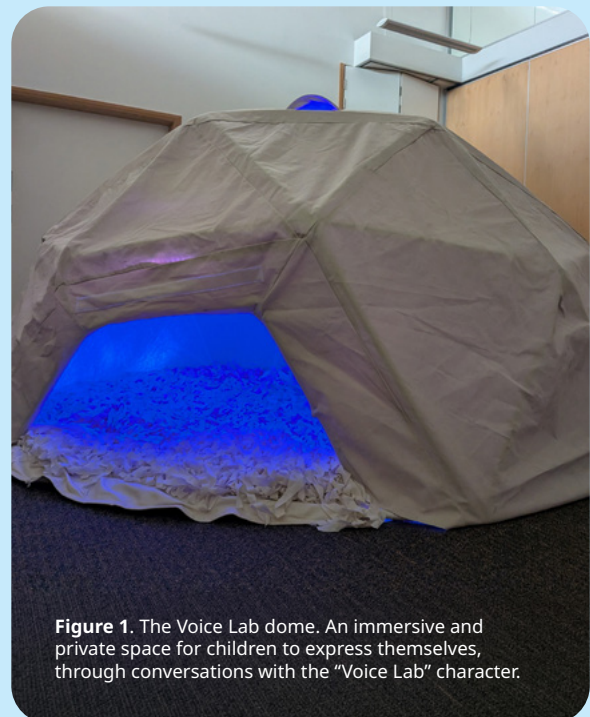


Figure 1. The Voice Lab dome. An immersive and private space for children to express themselves, through conversations with the “Voice Lab” character.



Figure 2. Left: A tree with a bird's nest being disrupted by a zombie. Right: A 'rainbow kingdom'. Learning was often expressed through a blend of real-world knowledge and imagination, highlighting play as a critical pathway for building environmental understanding.

while another noted that plants are important

“because they grow food for us.”

These insights reflect an early awareness of interdependence between people and the natural world, often expressed through imaginative play and drawing (see Figure 2).

Observations during play-based methods provided deeper insight into how children conceptualise ecosystems. In collaborative “Paper & Tape” sessions, children constructed a shared forest environment, incorporating trees, animals, sun, water and fire (Figure 3). Through this process, children demonstrated an understanding of both life-sustaining elements and environmental threats. In some cases, this understanding was expressed non-verbally through play (see Box 1), highlighting children’s ability to communicate ecological knowledge beyond verbal language.

Box 1: non-verbal expression of care for plants through play

Over two sessions, one child worked with a Polyglot artist to create a tree, nest, eggs, and a mother bird. In the second session, the child added a river and gently placed the tree’s roots into the water. This play interaction revealed a sophisticated understanding of ecosystems and tree survival.



Children also expressed empathy and concern for living things, alongside a developing sense of responsibility. One child captured this emerging agency, stating:

“ we need to do something to save the plants.”

While many children emphasised the importance of caring for animals and plants, they were sometimes less certain about how to enact this care in practice. Others framed care in relation to human needs (e.g., animals as food sources), or identified certain animals as dangerous, reflecting an emerging awareness of risk, safety, and coexistence.

These findings highlighted a key opportunity for the metropolitan ECEC to extend children's existing knowledge and curiosity in ways that foster environmental stewardship.

For example, children's limited practical understanding of how to care for nature could be addressed by intentionally embedding these concepts within teaching and learning. Importantly, the project demonstrated how listening to children can directly inform pedagogy.

This case study shows that from early childhood, children are already engaging with complex environmental ideas and expressing a desire to care for the natural world. By intentionally listening to children and responding to their insights, ECEC services can strengthen children's environmental responsibility and capacity to contribute to a climate-resilient future. If early childhood systems are to meaningfully respond to climate change, they must move beyond environmental education to embedding children's insights into everyday practice and policy.



Figure 3. Images of the paper forest constructed by children with support from Polyglot artists.

Appendix 1: How climate affects children's wellbeing and rights across The Nest domains

When early childhood education infrastructure is not adapted to climate change, increasing frequency and severity of extreme weather events affects children's wellbeing across all six domains of The Nest, and engages rights under the UN Convention on the Rights of the Child (CRC). Climate resilience requires investment in both physical infrastructure (buildings, energy, water, siting) and social infrastructure (educators, curriculum, disaster planning, community connection).

Nest Domain	Impact when ECEC is not climate-resilient	With resilient physical infrastructure	With resilient social infrastructure
 Valued, Loved and Safe CRC Arts 19, 36, 39	Service closures can disrupt children's access to stable routines. Post-disaster stress on families can be exacerbated if children cannot attend ECEC. Without effective disaster response plans, educators are less able to keep children calm, informed and safe.	Resilient buildings maintain stable, familiar environments during and after climate events. Structurally safe services can remain open as protective spaces for children during disasters. Climate-appropriate design reduces risk of prolonged closure. This includes flood, fire and cyclone resilient design solutions.	Educator disaster response plans ensure staff can keep children safe before, during and after events. Trauma-informed resources (e.g. Birdie's Tree, Be You, Emerging Minds) equip educators to support emotional safety. Services link families to wrap-around support, reducing carer stress and strengthening attachment.
 Healthy CRC Arts 24, 36	Poor air quality from bushfires can cause asthma and respiratory illness in young children. Buildings without cooling expose children to the impacts of extreme heat. Young children cannot regulate body temperature as well as adults. Climate events cause anxiety, trauma and sleep disruption. Educators in unsafe conditions are restricted in providing quality care.	Air filtration creates clean air spaces that act as refuges during smoke events. Insulation, ventilation and solar-powered cooling keep indoor environments safe year-round. Passive design (e.g. Passivhaus) reduces temperature fluctuations and allergens. Shaded outdoor areas – including planting trees and vegetation – reduce heat exposure. Replacing pavement or artificial play surfaces with grass, for example, can reduce heat exposure.	Adverse weather procedures embedded in centre culture protect physical and psychological health. Educators trained in mental health first aid support children's emotional recovery after events. Age-appropriate information helps children understand and cope with climate-related feelings. Educator wellbeing plans recognise that staff also need support to care effectively. Children use play, drawing and storytelling to process disaster experiences (e.g. floorbook approaches).

Nest Domain	Impact when ECEC is not climate-resilient	With resilient physical infrastructure	With resilient social infrastructure
 Learning CRC Arts 28, 29	Service closures caused 800,000 lost days of early learning in 2025. Heat reduces children's ability to concentrate and retain knowledge. Without environmental education, children can lack understanding of the environment and changes in climate around them. Repeated closures widen existing gaps in school readiness.	Climate-adapted buildings reduce closures and protect developmental milestones. Passive cooling design supports comfortable year-round learning conditions. Flood-resilient and fire-resistant construction reduces rebuild time and gets children back to learning faster.	Sustainability embedded as a principle in the EYLF gives children foundational knowledge about their environment. Climate, weather and disaster education integrated into daily curriculum — not as an add-on but as core learning. Educators supported to move beyond token sustainability activities into deep pedagogical practice.
 Participating CRC Arts 12, 13, 31	Service closures remove children's primary space for peer interaction and play. Children excluded from decisions about their safety miss opportunities for agency. Damaged outdoor areas reduce physical activity, social connection and free play.	Cool and shaded outdoor spaces support continued play, exploration and social connection in hot weather. Child-friendly design features give children safe spaces to interact with nature. Green infrastructure (gardens, vegetation) creates hands-on learning environments.	Children co-design their learning spaces and outdoor environments, building ownership and agency. Age-appropriate disaster planning done with children — not just for them — builds resilience and voice. Children have a say on climate risks in their own settings, identifying hotspots and solutions (see MCRI case study).

Nest Domain	Impact when ECEC is not climate-resilient	With resilient physical infrastructure	With resilient social infrastructure
 Material Basics CRC Arts 24, 27	Damaged infrastructure removes access to food, clean water and shelter. Power outages disable heating, cooling and refrigeration. Families in areas with fewer resources face longer closures and slower recovery.	Solar panels and battery storage keep services operating during power outages. Water harvesting supports continued access to clean water during drought and after events. Climate-resilient construction reduces long-term rebuild costs and maintains access.	ECEC centres can serve as community hubs during recovery and can provide food, care and a stable base for children. Educators trained in community support pathways help families access the services they need. Continuity of care enables parents to participate in recovery efforts and return to work.
 Positive Sense of Culture & Identity CRC Arts 29, 30	Disruption to place-based and on Country learning, including relocation due to climate events, affects cultural connection. Loss of community gathering spaces weakens cultural practice and belonging. Interrupted sustainability education reduces children's sense of environmental identity and citizenship.	Resilient services sustain cultural programs and connections to Country through continuity of place. Green infrastructure designed with community input reflects local ecology and cultural values. ECEC centres as community infrastructure preserve gathering spaces and cultural practice.	First Nations knowledge of environmental stewardship is embedded in sustainability pedagogy. Sustainability education goes beyond token activities (e.g. worm farms) into deep connection to place and culture. Children develop environmental identity as active, thoughtful citizens through integrated curriculum.

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About ARACY

ARACY champions the wellbeing of all Australian children and young people. Together, we drive systemic change, collaborate with communities, and amplify young voices to create a healthier future. Our work focuses on prevention, early intervention, and equity. Our purpose is for every child and young person to thrive.

ARACY and our initiatives are focused on holistic wellbeing, including health. We aim for sustainable system changes to prevent diseases and promote early intervention. Our commitment to the complete wellbeing of children and young people drives us to seek meaningful and continual systems improvements. Learn more at www.aracy.org.au



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