How climate change affects mental health in Australia

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60 Leicester Street,
Carlton Vic. 3053
0422 974 857
admin@dea.org.au
www.dea.org.a

Introduction

Climate change has serious and wide-reaching impacts on mental health of Australians today – we are experiencing increasingly frequent and severe extreme weather events with the realisation of worse to come.[1,2,3] The mental health impacts of climate change are placing increased strain on Australia's health system,[4,5] which is already under pressure. Almost half of Australians are expected to experience a mental illness at some point in their life, with costs estimated to exceed $190 billion per year.[6] Children and young people are at particular risk, with climate change impacts over recent decades linked to declines in child and youth mental health.[1,7-9] Without a rapid transition away from fossil fuels and towards restoring nature, we can expect to see further increases in mental disorders and emergency mental health presentations among young people.[10-13]

The direct effects of hotter temperatures and extreme weather events increasing adverse mental health outcomes is now well established in medical literature.[14-19] Climate change has further indirect effects, increasing known risk factors for psychological distress and mental illness.[15,17,19] It influences rates of physical illness, like asthma and heart disease, which in turn can affect mental health.[11,20,21,34,104] Complications during pregnancy including pregnancy loss, prematurity and low birth weight are another area of concern.[22,23] Children who are born prematurely or with low birth weight have higher rates of mental disorders as well as those of the developing brain and nervous system.[24,25] This report explores the direct, indirect and physical illness-mediated relationships between climate change and mental health, as well as describing how concern about climate change can itself lead to psychological distress.

The United Nations Intergovernmental Panel on Climate Change (IPCC) report confirms that human activities are unequivocally causing climate change.[26] Australia has already warmed by 1.51 degrees and 2024 was the warmest year on record globally.[27] Working with communities to drastically reduce emissions this decade, governments can still prevent the worst of global warming, with enormous benefits to mental health and wellbeing.[10,12,28] At the same time, a comprehensive response to climate change mental health impacts will require substantially increased resourcing in order to meet the escalating needs into the future.[10,29-32] This should include investment in the capacity and resilience of the mental health system, collaboration with communities to build capability to respond to natural disasters and manage less serious symptoms, and attention to climate change impacts on other known vulnerabilities for psychological distress and mental illness.[15,20]

This report discusses climate change and mental health including mental illness and suicide. This information may be distressing. Please see the list of resources for coping with climate distress for support, knowing that caring for yourself is necessary, both to respond effectively, and to help others.[29,33]

Climate Change and Mental Health

Mental health consequences of climate change can be considered under four broad categories: direct, indirect, physical health and awareness.[11]

The pathways of harm extend beyond simple, linear patterns, and an individual may experience multiple interacting impacts from each category over time. They may also be influenced by social and cultural factors, as well as underlying vulnerability or protective factors. For instance, Aboriginal and Torres Strait Islander cultural knowledge includes sophisticated ways of understanding and responding to the interconnectedness of nature, human activity and mental health. This knowledge, which includes caring for Country, has been maintained over thousands of years without causing climate change.[88,89,105]

A systems model illustrating interactions between climate change impacts and mental ill health is shown in Figure 1.

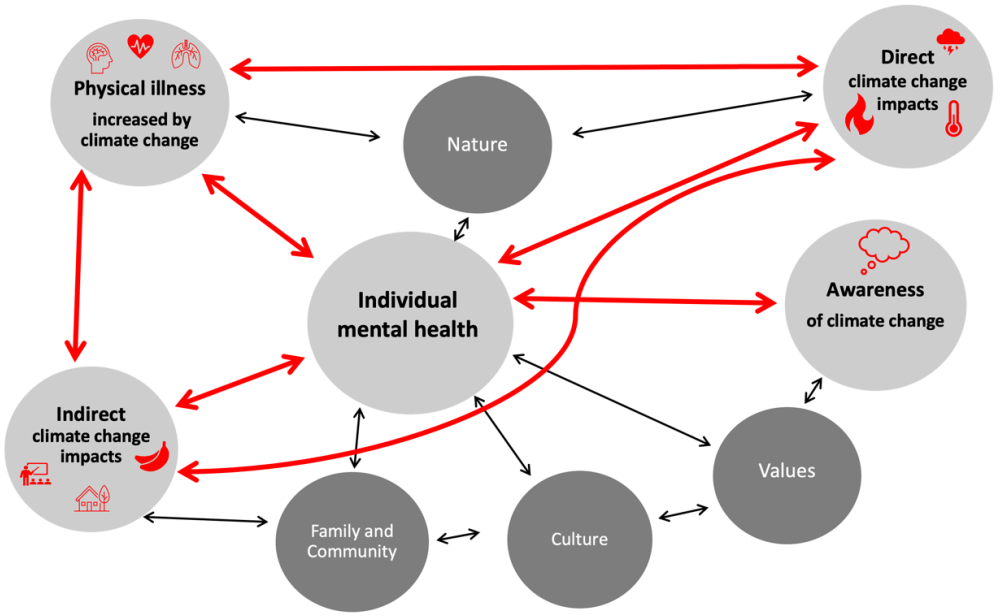

Figure 1: Climate change interactions with mental health, adapted from Dey, C., Perkes, I., Handley, T. & Wilhelm, K., 2023 with permission.[117]

Direct mental health consequences of climate change

Climate change drives increasingly severe and frequent extreme weather events such as extreme heat, bushfires, storms, floods and drought – most Australians have now experienced one or more extreme weather events.[2,35]

Psychological distress from these events may be due to experiencing a threat or loss (such as having to evacuate one's home due to flooding) or other sources of distress (such as heat) directly causing mental distress,[36] interpersonal violence, or non-physical relationship conflict.[37] For children, the experience of having a parent or caregiver's life threatened during an extreme weather event can lead to post-traumatic stress disorder (PTSD), even if the child themselves was not under direct threat.[38] Other serious mental disorders such as depressive, anxiety and substance use disorders are increased by exposure to extreme weather events, such as floods and bushfires.[19,39-41]

With the increase in frequency and severity of extreme weather events, approaches for 'once in a lifetime' traumatic events are no longer applicable.[35] Australians must find ways to adapt to repeated extreme weather events, while also taking action to reduce future extreme weather by rapidly reducing carbon emissions.[35]

In addition, secondary disruptions to social, economic, physical and health infrastructure compound the impacts of events, especially for those who are already marginalised.[17] For example, people living with severe mental illness have much higher rates of hospitalisation and death during heatwaves and following other extreme weather events.[42,43] Additionally, extreme weather events disrupt community mental health services, including facilitation of medication. Individuals may become acutely mentally ill in the absence of appropriate support, and this may also put others at risk.[43]

The spectrum of impacts ranges from mild transient distress which resolves without external intervention, to severe mental illness requiring the long term involvement of specialist services.[3,33,44-46] Australian research following the Victorian Black Saturday bushfires found increased PTSD, depression, and alcohol misuse in affected communities, persisting years after the event.[46] Presentation can occur months or years following the acute event, and childhood exposure is linked to an increased risk of mental disorders as an adult.[11,47]

Parental mental illness further increases the mental health risk for children. This happens particularly when parents are not able to access timely, effective treatment or other important protective relationships are disrupted, such as with extended family, local community or schools.[11,48]

When events are perceived to occur as a result of inaction or negligence from those meant to protect us, they may be seen as a betrayal or act of interpersonal violence which can make them more psychologically damaging.[49] This interpersonal dynamic can increase mental health disorders, including PTSD, and worsen recovery outcomes.[11,17]

Compound events, made more likely due to climate change, occur where multiple extreme weather events intersect, with less time for recovery and erosion of resilience factors.[35,103] An example of this can be seen in the bushfires, flood and cyclones which have affected the east coast of Australia in rapid succession since 2019. These domino crises compound and magnify mental health impacts.[50]

Increasing heat is linked to the worsening of multiple indicators of mental ill health. There is clear evidence of increased mental health emergency department presentations and hospital admissions with hotter weather, which increase as the heat increases, especially when high temperatures are combined with humidity.[20,21,51,52,53] This occurs across the full spectrum of mental ill health and age ranges from young children to the

elderly.[51-53] Heat-related mental ill health is more marked in people with pre-existing mental illness and the elderly.[44,54]

People with severe mental illness, with substance use disorders and with dementia are at markedly increased risk of serious illness, hospitalisation and death during heat waves.[43,55,60] While some medications for mental health conditions can reduce physical tolerance to heat, others do not.[56,57] Importantly for people with serious mental illness, the risks of relapse during hot weather will usually outweigh potential benefits of lowering or stopping medications. Therefore, access to cool shelter and mental health care are generally recommended instead.[43] Decisions about medication changes during hot weather, should be made in consultation with the person's prescribing medical practitioner. Low sodium levels related to medication use and other factors during heatwaves can cause physical and mental health problems. People living with dementia are at risk of hospitalisation during extreme heat. Cognitive difficulties reduce the capacity to adapt by drinking water, using cooling or seeking help.[60] Pregnancy combined with severe mental illness increases the risk for psychiatric emergencies during hot weather.[58]

An Australian study showed that young people presented with suicidal thoughts and behaviour even with mildly hot weather and these worsened the hotter it became (a dose-response effect).[36] Previous suicidal behaviour is a risk factor for death from suicide, and this is particularly important given that suicide is the leading cause of death for 15-44 year olds in Australia.[59] These findings are consistent with Australian data which show an overall trend towards increased suicide rates with increased annual temperatures.[4,11,21,56,63]

High temperatures already account for 1.8% of the annual burden of mental and behavioural disorders in Australia.[106] This yearly burden of mental ill health is projected to increase by over 10% in the 2030s and between 28-49% in the 2050s, where higher emissions are linked to a greater burden of mental and behavioural disorders.[106]

Indirect mental health impacts of climate change

Flow on consequences of extreme weather events, along with subacute and chronic climate and environmental changes (such as drought and sea level rise), can impact mental health via complex social, economic and cultural interactions.[17,19,41]

In the aftermath of extreme weather events, there are multiple pathways by which basic needs for health such as clean air, water, food and shelter can be threatened.[11,41] Studies in Australia and internationally have found that hot weather and heat waves are associated with increases in physical and sexual assaults and with domestic violence.[37,62] Violence traumatises surviving victims, including children, whose mental health can be seriously harmed, even if they are not targeted.[38] Hot weather is also associated with poorer learning for children, with predictions that this problem will worsen with increasing climate change.[63] Displacement, economic disruption, and breakdowns in physical and social infrastructure including health services, can all increase isolation and undermine social cohesion.[11,41]

These impacts are experienced differently by those who are already marginalised or vulnerable as a result of age, health, race, education or socioeconomic disadvantage – and this creates widening gaps in existing inequalities.[17,41] During the 2017 floods in Northern NSW, people at socioeconomic disadvantage were more likely to be displaced, and for longer periods, with resultant worse mental health outcomes. Aboriginal and Torres Strait Islander people fell disproportionately into this group.[64]

Globally, climate-driven food and water shortages have been precipitants of social unrest, conflict and displacement, the burden of which is felt most strongly by people who are already marginalised, including women and children.[10,11] Pregnancy and the post-partum period are periods of increased mental health risk, both for the woman and her offspring.[8,11,65] As such, these flow on impacts of climate change can be seen to amplify existing structural and intergenerational injustices.[17,66,67] The downstream effects are complex and can happen at different times and locations from the climate-driven event that started them.[68] A systems thinking approach is required to adequately understand these interactions and to identify potential solutions.[17,19,68]

Effects of awareness of climate change on mental health

The awareness of the unfolding threat of climate change can in itself have mental health impacts.[1,17,19] Given the worldwide reach of news reporting and the ready access to information afforded by the internet, there are many avenues through which individuals may be exposed, and so psychologically affected, by climate change.[1,41] Responses commonly include feelings of anxiety, grief, hopelessness, frustration and anger.[1,69]

Most Australians are very concerned about climate change.[70,71] Research demonstrates that government inaction on climate change is linked to increasing climate anxiety in young people.[49] A 2021 representative survey of over 10,000 Australians under 30 years of age found that 93% believe that government is not doing enough to address climate change.[70] Health professionals in Australia are twice as likely to be concerned or alarmed about climate change than the general population, with 53% alert or alarmed in the largest survey to date.[71,72] Despite this, many health professionals are not yet communicating the urgency of action to protect human health, including mental health, from climate change.[71]

It must be acknowledged that distress about climate change is not inherently pathological and is a shared, normal, rational response to an abnormal and prolonged global situation.[73] Nonetheless, it may create substantial distress and functional impairment which may lead to clinically significant anxiety or depression for some individuals, perpetuated by the lack of effective global and local action to respond to the real threat of climate change. The term 'psychoterratic syndrome' has been coined to describe the specific emotional responses to climate change and environmental degradation. This includes phenomena such as eco-anxiety, climate grief and solastalgia.[74]

Eco-anxiety or eco-distress can be defined as the 'chronic fear of environmental doom', and may include a range of 'anxiety, worry, stress, hopelessness, sleep disturbance, irritability, despair, bodily symptoms of anxiety (e.g. awareness of heartbeat, butterflies in stomach, sweaty palms, perceived shortness of breath)'.[41] Eco-distress and eco-anxiety have been found across the lifespan and may particularly affect young people.[71] Climate grief or ecological grief is 'the grief felt in relation to experienced or anticipated ecological losses, including the loss of species, ecosystems and meaningful landscapes due to acute or chronic environmental change'.[71] Ecological or climate grief especially affects people with strong ties to a particular place and those witnessing environmental destruction, like Indigenous peoples, farming communities and climate scientists.[71] Solastagia is the emotional response to the negative transformation of a loved home environment that has been described in many communities, including farming communities and among Torres Strait elders.[41,75,76]

Critically, without concerted action to limit warming to this decade, we will experience irreversible and catastrophic effects on the environment on which our lives depend.[28] It cannot be overstated that

experiencing distress in the face of this reality is a rational response to a significant threat, and not in itself pathological.[77]

Physical health impacts of climate change affecting mental health

Physical health impacts of climate change include increases in a range of conditions such as heart disease, stroke and worsening of neurological diseases such as multiple sclerosis.[107,108] Air pollution, both due to bushfires and from burning of fossil fuels, also increases heart disease and cerebrovascular disease.[116] These conditions may be associated with an increased rate of depressive disorders – for example, in 20-30% of people with heart disease and 30% of people following stroke.[34,109,110]

Rates of asthma are increasing via multiple pathways from climate change (increased pollen allergens from heat and humidity and increased air pollution) and asthma has a two-way relationship with anxiety disorders where one worsens the other.[11,24]

The risk of physical complications during pregnancy are increased through multiple pathways, including exposure to hot and extreme weather, food and water insecurity and forced migration.[81] These changes driven by climate change impact pregnant women and their families. For example, extreme heat can lead to pregnancy loss, prematurity and low birth weight. This may increase depressive and anxiety disorders for the mother and neurodevelopmental and mental disorders for children who are born prematurely or with low birth weight.[8,81,82]

These broad categories of direct impacts, indirect impacts, physical illness and awareness of climate change can and do impact people and communities together, not just in isolation. As the pace of climate change intensifies, they will increasingly occur together. For example, 80% of the Australian population were directly or indirectly affected by the Black Summer fires of 2019/20.[83]

People most affected by climate change impacts on mental health

Although anyone can be affected by climate change, the impacts are not equally distributed, with those who contribute least to climate change among those most affected. Populations who are most impacted include Indigenous peoples, refugees, people living in poverty, people with pre-existing mental disorders, people with disabilities, women, LGBTQI+ people, the very young and the very old, those who are experiencing unemployment, homelessness or are otherwise marginalised.[11,17,41] Other groups at higher risk of climate impacts include people living in rural or remote communities, frontline emergency workers, and those working in environmental fields.[17,41]

Of the five leading causes of the burden of disease among Australian children (5-14 years), four are mental or neurodevelopmental disorders. The other, asthma, is associated with higher rates of anxiety disorder. All five of these are increased by the impacts of climate change.[24,84] Children and adolescents are especially vulnerable to mental health disorders and distress as a result of climate change and experience PTSD, anxiety, phobias, sleep disorders, attachment disorders and substance abuse as a result.[85] They may be additionally affected by climate-related mental illness and psychological distress in their caregivers.[86,87] This can impact the developmental trajectory and result in learning difficulties, cognitive and language delays and difficulties with emotional regulation.[86]

Indigenous people are particularly at risk due to the centrality of connection to Country and culture, which is uniquely disrupted through environmental degradation.[88] Indigenous people are more likely to live in areas at increased geographic risk, such as the low-lying Torres Strait Islands and the hot, dry environment of central Australia. Experiences of intergenerational trauma, displacement and marginalisation as a result of colonisation compound these risks.[89]

People living in rural and remote communities are at increased risk of mental health impacts of climate change, and have lower levels of funding, resources and more fragmented mental health care over time. Farmers and others whose livelihood depends on primary production and stable climactic conditions, also represent a group at increased risk.[17] Australian research has identified an increase in suicide for men in rural farming communities following prolonged drought. [90] There has been a pattern of short-term interventions being brought in during and following crises, such as the 2019-2020 bushfires and floods. However, there is a need for engagement of local communities in longer-term solutions, including for mental health services.[91] As the social and emotional impacts of climate change persist, such as extreme weather events, sustained local resources are needed, including community-based, sufficient and stable mental health services.[50]

Frontline emergency service workers, such as firefighters, police, ambulance and State Emergency Service volunteers, are well known to be at increased risk of PTSD and other mental health conditions due to traumatic exposures. Climate change increases the frequency and intensity of exposures for this group.[92] Scientists, environmental workers, conservationists and others who work closely with the environment are also vulnerable to increased climate related distress.[17] This has been described as 'pre-traumatic stress', in that they are dealing with evidence and predictions of frightening realities on a daily basis.[2]

What can we do?

The 2023 IPCC AR6 report confirmed that it is unequivocal that human activities are causing climate change[26] – 2024 was the warmest year on record globally[93] and Australia has already warmed by 1.51 degrees celsius.[27] In light of this, and the profound impact on mental health, a comprehensive response will require substantially increased resourcing in order to meet the escalating needs of our communities now and into the future.[29-32,94]

To successfully address climate mental health impacts, action is required at multiple levels – individual, organisational and local community as well as state and national policy.

State and national responses

Governments working with communities to drastically reduce emissions this decade can still prevent the worst of global warming, with enormous benefits to mental health and wellbeing.[28] Listening to and working alongside Aboriginal and Torres Strait Islander peoples, whose cultural knowledge is now recognised internationally offers insights into improving and protecting mental health.[89,105]

Protecting and restoring nature is crucial, not only to lower emissions, but also because access to nature can improve emotional wellbeing, support positive behaviour and reduce aggression for children.[112,113,118] Importantly, government action also builds trust, hope and positive visions of the future, all of which are important means of supporting young people and the community more broadly, to cope with climate-related

distress.[77] This includes strong, decisive action to reduce the carbon emissions from health care, including mental health care, whilst improving quality and access to mental health care in Australia.[9,95,96]

In Australia and globally, mental health care is consistently underfunded, and existing systems do not have the adaptive capacity to respond to projected increased needs due to climate change.[10,55] A climate-resilient mental health sector requires substantial investment and innovation, and this should be based on the modelling of current and predicted climate impacts.[55]

For example:

- **Investment to increase workforce capacity** of services and infrastructure must account for the expected increases in mental healthcare needs with climate change,[55,96,97] including increases in rates of mental disorders and emergency mental health presentations with rising temperatures.[98]
- Policy responses in disaster-affected communities need to be **long term, embedded and sustainable,** rather than short term interventions in the immediate aftermath.[55,91]
- Evidence-based suicide prevention must consider the evidence pointing to **increased risk for death from suicide with hotter temperatures**. This is especially important given that suicide is already the leading cause of death of 15-44 year olds in Australia, and that temperatures in Australia are already rising and can be expected to rise more than in most other high-income countries.[51,98]
- Policy development should not consider mental health responses in isolation, but also consider the **impact of climate change on other known risk factors for mental ill health**.[96]
- The adoption of **health adaptation plans at all levels of health care**, including the National Health and Climate Strategy, will allow for proactive rather than reactive adaptation to ongoing climate pressures. Such plans must be supported by adequate funding and workforce capacity building.[96]

Organisational and local community responses

A climate-resilient mental health sector requires focusing on education of mental health professionals, developing enhanced assessments, harnessing existing strategies, increasing social prescribing to harness the mental health co-benefits of climate action, as well as prioritising families and a health equity approach.[55,87]

Local efforts to protect and restore nature also have evidence-based mental health benefits – access to nature spaces during childhood improves focus and concentration.[112,113] Planting and maintaining trees in urban areas provides cooling effects beyond those of shade alone,[119] and could reduce harmful effects of heat on mental health.[120] Reducing air pollution improves learning, among other benefits.[114,115]

Ensuring that mental health services include ongoing, rather than transient, community-based services that are actively co-designed, engaged and delivered in partnership with local communities, is key to these being effective, particularly in Indigenous, refugee, transcultural, rural and remote communities.[55,99]

At a community level, building capability for psychological first aid and social supports so that individuals can successfully manage less serious symptoms without requiring a mental health service response, is important to help manage increasing health service demand.[69]

Australian research in disaster-impacted communities has shown that community-led collective action and planning 'can build social and relational capital, engender feelings of belonging and increase informal social

connectedness, while simultaneously helping communities prepare for the impacts of climate change'.[100] These are all important protective factors that can mitigate mental health impacts.

Further research is urgently needed to guide the development of evidence-based interventions to support climate-affected communities and to ensure that investment in existing approaches such as psychological first aid is justified.[101]

Individual-level responses

With awareness of the reality of climate change, there is a need to address the psychological dimensions at a personal level if we are to engage effectively.[87] Health professionals providing mental health care need to ensure that they attend to their own wellbeing, including having strategies to avoid burnout.[87] Similarly, those who work or volunteer in climate action advocacy are at significantly increased risk of burnout. Strategies to prevent this are essential.

For clinicians working with individuals and communities experiencing climate distress, there is a need for education about this topic,[71] along with evidence-based frameworks for assessment and management. These should avoid pathologising rational distress, while correctly identifying individuals where the distress is leading to clinically significant illness.[3,87]

Effective strategies for managing climate distress as individuals include acceptance and validation of thoughts and feelings relating to climate change, positive reappraisal of the situation in an ecological, historical and societal context, engaging with personal values and drawing on sources of hope and trust.[87] Other key themes to emerge are the importance of connection to others for support and validation, engagement with nature as a source of wellbeing, taking action on climate change as a means of empowerment – and particularly for scientists, activists and environmental workers – strategies for self-care and avoiding burnout.[87]

However, focusing on addressing distress at an individual level must not detract from the need for decision makers to take strong policy and legislative action to directly address climate change, the cause of the distress itself.[61,71,87] This supports the development of genuine hope and trust, and facilitates a sense of agency, which allows for healthy adaptation to occur.[87,102]

We can make a difference by addressing climate change and mental health at all these levels. Responding collaboratively, based on the best available evidence, can interrupt vicious cycles, reduce mental ill health now and into the future and provide good quality mental health care to people who need it.

Resources for coping with climate distress

General

- Advice, support and connection from Climate Resilience Network
- Climate change – Australian Psychological Society
- Psychology For A Safe Climate
- Mental health and climate change resource list hosted by NSW Government Climate Risk and Net Zero unit

Parents, families and young people

- A guide for parents about climate change – Australian Psychological Society
- I'm worried about the environment – Kids Help Line
- Heat, children and young people's mental health – Sydney Children's Hospitals Network

For young people to connect with others and peaceful action:

- Seedmob - Australia's first Indigenous youth and climate network
- Australia's largest youth run climate network

For parents and carers to connect with others and peaceful action:

- Parents for Climate
- Climate Mental Health Network parent resource list

Resources for health professionals

- Psychology for a Safe Climate
- Mental health and climate change resource list – NSW Government Climate Risk and Net Zero unit
- Policy and advocacy: Climate change and Aboriginal and Torres Strait Islander Health – Lowitja Institute
- What Mental Health Professionals Can Do About Climate Change – Climate Psychiatry Alliance

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About Doctors for the Environment Australia

Doctors for the Environment Australia (DEA) is an independent, non-government organisation of medical doctors in all Australian states and territories.

DEA's work is based on the premise that humans need a future with clean air and water, healthy soils capable of producing nutritious food, a stable climate, and a complex, diverse and interconnected humanity whose needs are met in a sustainable way. We are therefore interested in environmental protection and restoration to promote human health and social stability and clean energy to reduce the impacts of fossil fuel industries on human health.

Acknowledgement of Country

Doctors for the Environment Australia's members live and work around Australia. We would like to acknowledge Aboriginal and Torres Strait Islander peoples as the Traditional Owners of these lands, in the spirit of reconciliation.

We recognise that First Nations peoples have cared for Country and lived sustainably for millennia, and that sovereignty of this land was never ceded. We pay our respects to First Nations Elders past and present, and to emerging leaders.