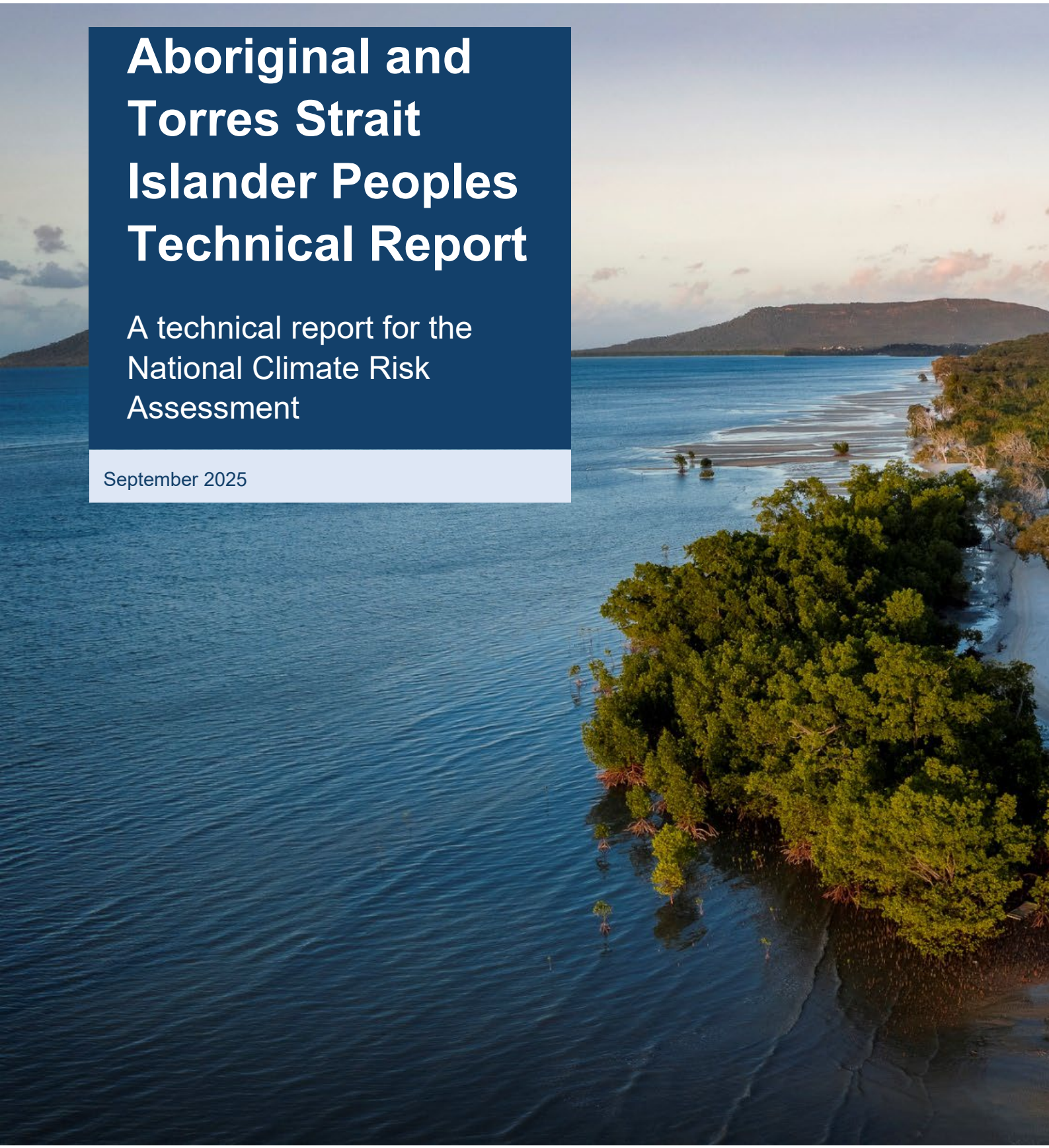
Australian Government

Australian Climate Service

Aboriginal and Torres Strait Islander Peoples Technical Report

A technical report for the National Climate Risk Assessment

September 2025



Acknowledgement of Traditional Owners
The Australian Climate Service pays respect to the Aboriginal and Torres Strait Islander peoples and their Nations of Australia.

We acknowledge their deep cultural, social, environmental, spiritual and economic connection to their lands and waters.

The Australian Climate Service values the role Aboriginal and Torres Strait Islander peoples' knowledge and cultural values could play in understanding and responding to Australia's climate and natural hazard risk.

Cover image: Elim Beach (Thiithaarr) on Guugu Yimithirr country. Credit: Dominic Jeanmaire

Cataloguing data title: *Aboriginal and Torres Strait Islander Peoples Technical Report. A technical report for the National Climate Risk Assessment*, 2025. CC BY 4.0

Accessibility
The Australian Climate Service makes its documents and information available in accessible formats. On some occasions the highly technical nature of the document means that we cannot make some sections fully accessible. If you encounter accessibility problems or the document is in a format that you cannot access, please contact us.

Contact details | acs@acs.gov.au | www.acs.gov.au

About the Australian Climate Service
The Australian Climate Service is a partnership between the Bureau of Meteorology, CSIRO, the Australian Bureau of Statistics and Geoscience Australia.

Foreword

Yaama (Hello - Gamilaroi) and *murrabuu* (Thank you- Gamilaroi) for the opportunity to pen the Foreword for this significant chapter.

I acknowledge the many Nations of Aboriginal and Torres Strait Islander people, whose cultures and customs have nurtured and continue to nurture our cultural estates and maintain and protect our land and sea Country, including the wonderful tapestry of cultural sites of significance that are embedded within each of our own cultural footprints.

I would like to acknowledge the Aboriginal and Torres Strait Islander people who actively participated in the NCRA 1st pass. The foundations laid from your valued and very much appreciated knowledge has certainly set us up for success in the NCRA 2nd pass.

I feel honoured to work with the Australian Climate Service to lead the collaboration for this system of the National Climate Risk Assessment. I acknowledge and take this opportunity to say a huge *murrabuu*, for those who engaged in NCRA 2nd pass. The energy and commitment from Aboriginal and Torres Strait Islander stakeholders was wonderful to be a party to. *Murrabuu* to the ACS executive for their commitment to creating the opportunity to bring together traditional knowledge and western science. The two Gatherings were inclusive, informative and impactful. The testimony to the success of each session, can be found within the content of this Chapter.

My mind now turns back to those who have come before us, as I *nhalawilbayn* (reflect - Gamilaroi) on the challenges they faced, as well as those still being experienced by Aboriginal and Torres Strait Islander communities, leaders and knowledge holders (across Australia), who remain disadvantaged, marginalised and dispossessed of land, water, knowledge and a cultural way of life. The legacy of dispossession continues in environmental, economic, social and political disadvantage. In Australia there have been numerous reports and inquiries which have described the nature of Indigenous disadvantage. These disadvantages are clear across a range of indicators including health, access to justice and education, and abnormally high levels of incarceration.

In the Aboriginal and Torres Strait Islander worldview, people and Country (including lands, waterways and seas) are interdependent entities that are intrinsically linked in the landscape through cultural and spiritual significance. This means that there is no separation of nature and culture - the health of the natural environment and cultural wellbeing of Aboriginal and Torres Strait Islander peoples is directly influenced by the health of the cultural landscapes.

Over these millennia, or since time immemorial, Aboriginal and Torres Strait Islander peoples have sustainably managed their lands, waters and natural resources for the health of their Countries and our peoples. Aboriginal and Torres Strait Islander peoples have understood the importance of healthy Country, healthy people and their cultural responsibilities, which is central to our cultural way of life and quality of life. Aboriginal and Torres Strait Islander traditional ecological knowledges, like our stories, are passed down from generation to generation and continue up until this day. This has allowed us to live in a symbiotic relationship with the land, water and the many resources that have sustained our increasing populations. Aboriginal and Torres Strait Islander people and communities used it, lived from it and nurtured it. Aboriginal and Torres Strait Islander use was and remains sustainable.

Through our dispossession, and then mismanagement of our lands and waters, with a disregard for our culture, knowledge and understanding, we have witnessed the detrimental

effects upon both our peoples and our environment, for we exist in harmony and in pain with our traditional Countries.

Aboriginal and Torres Strait Islander communities have complex knowledges which support and reinforce their relationship and deep connection to Country. They have distinct responsibility to care for Country and in particular, protect cultural sites of significance. Our traditional knowledge has sustained us, as a people, to live and thrive on the driest inhabited continent on this planet since time immemorial.

Increasingly in Australia and globally, Indigenous knowledges are being recognised as an important factor in human and planetary survival. Application of Aboriginal and Torres Strait Islander peoples' knowledge is recognised internationally as relevant and of practical importance to adapt to and mitigate the impacts of climate change. In Australia, the environmental law framework acknowledges the importance of the knowledge and input of Aboriginal and Torres Strait Islander peoples' knowledge to natural resource management and in meeting global challenges such as climate change. This is reflected in acknowledgement in legislative objects and including Aboriginal and Torres Strait Islander people as members of consultative communities to decision makers.

However, acknowledgment or consultation does not necessarily translate into decision makers taking relevant Indigenous knowledges into account in climate change decision making, nor does it translate into Aboriginal and Torres Strait Islander peoples' knowledge Holders having meaningful input into the final outcome. The absence of legal obligations for climate change decision makers to account for Indigenous perspectives means that real change as a consequence of Indigenous knowledge and practices is still not occurring at the rate it needs to, particularly given the accelerating impact of climate change.

The Australian Government and its decision makers, have a unique opportunity to embrace Indigenous knowledge such as that within this Chapter, and weave it into the strategies and policies that will be guiding us forward. Only this will protect and mitigate further impacts / major threats to the physical and emotional health of Aboriginal and Torres Strait Islander communities, people, land and sea Country and enable our ability to sustain our traditional life, languages, cultures and knowledges.

In 2016, Dr Yunupingu wrote in The Monthly:

"*What Aboriginal people ask is that the modern world now makes the sacrifices necessary to give us a real future. To relax its grip on us. To let us breathe, to let us be free of the determined control exerted on us to make us like you. And you should take that a step further and recognise us for who we are, and not who you want us to be. Let us be who we are – Aboriginal people in a modern world – and be proud of us. Acknowledge that we have survived the worst that the past had thrown at us, and we are here with our songs, our ceremonies, our land, our language and our people – our full identity. What a gift this is that we can give you, if you choose to accept us in a meaningful way*."

Yanaay (Will Go)

Professor Phil Duncan

Galambany Professorial Fellow, Centre of Applied Water Science, University of Canberra

Contents

Figures

Case Studies

Glossary

Term	Definition
ACCU Scheme	The Australian Carbon Credit Unit Scheme.
Biopiracy	The theft of cultural knowledge and intellectual property of Aboriginal and Torres Strait Islander Peoples, specifically related to ecological and farming methods.
Intergovernmental Panel on Climate Change (IPCC)	The IPCC is a body of the United Nations responsible for assessing the science related to climate change across the world.
Lore	The term “Lore’ refers to the customs and stories of Aboriginal peoples learned from the Dreamtime. Traditional Aboriginal Lore was passed on through the generations through songs, stories, dance and land, it governs all aspects of traditional life. There are four key components to Traditional Aboriginal Lore: land, origin, respect and Elders this Lore has continued to govern our people for all of our existence. We have modified this to embrace the vales that derive from our Lore (Mallee District Aboriginal Services, 2022).
National Agreement on Closing the Gap (Department of the Prime Minister and Cabinet, 2020)	An Australian Government Initiative, tabled in 2008 to help address inequalities between Aboriginal and Torres Strait Islander Australians, and non-Aboriginal and Torres Strait Islander Australians. Re-drafted in 2020, the Closing the Gap Report identified a framework for striving for change.
Totem	A totem is a spiritual emblem that can take the form of an animal or plant, which Aboriginal and Torres Strait Islander peoples are connected with, and are usually sacred (NSW Government Office of Environment and Heritage, n.d.).

About the authors

Prof. Phil Duncan (Galambany Professorial fellow University of Canberra, Centre of Applied Water Science)
A member of the Gomeroi Nation, Dr Leslie 'Phil' Duncan's homelands are Moree and Terry Hie Hie, and he has a strong connection to the Wiradjui Nation, but clearly identifies as a Gomeroi Mari (Man). Phil provides high level policy and strategic advice and leadership to key indigenous representative organisations, universities, state and federal government agencies, and key external stakeholder groups. Phil has made significant contributions in a variety of domains from education and organisational reconciliation action through to areas of focus such as natural resource management, freshwater river management, forestry, native fish, water rights and allocations.

Claire Connell (Impact Co)
Claire was a deeply valued Consultant at Impact Co., bringing over 10 years of experience advising, supporting, and guiding groups and individuals to create meaningful impact. Her work spanned the climate change, health and mental health, and First Nations sectors, where she consistently demonstrated her commitment to collaboration, equity, and long-term change. Claire played a key role in the Australian Energy Transitions Initiative, helping design workshops that charted decarbonisation pathways for heavy-emitting industries. She also helped lead the Land Use Futures Summit, which delivered climate-focused solutions and a ten-year roadmap to strengthen Australia's natural capital.

Tragically Claire passed away in February 2025. Her integrity, compassion, and dedication to a better future continue to inspire us, and her impact will be felt for many years to come.

Tanya Schneider (Australian Climate Service)
Tanya is the General Manager of Delivery for the Australian Climate Service. Joining the ACS 18 months ago, Tanya is focused on delivering value to ACS customers through improved access to climate risk data and insights and uplifting the national understanding of who is most vulnerable and exposed to hazards and the changing climate. Tanya drives the implementation of programs that deliver innovation, navigating ambiguity and influencing diverse stakeholder groups to deliver results.

Acknowledgements

The Australian Climate Service is a partnership that brings together expertise from the Bureau of Meteorology, CSIRO, the Australian Bureau of Statistics and Geoscience Australia to bring the Commonwealth's extensive climate and natural hazard information into a single national view.

This report was developed by the Australian Climate Service, with collaboration and support from the Department of Climate Change, Energy, the Environment and Water.

Advice and expertise

We would like to extend our thanks to the following contributors who supported the project with their valuable knowledge, experience and advice.

Graham Ambridge

Conrad Bilney

CSIRO

Shol Blustein

Tania Brown

Jackson Browne

Alice Burgess

David Collard

Melinda Eades

Rohan Henry

Chris Johnston

Judith Landsberg

Eric Lede

Francine Machin

Vicki Manson

Hilda Mosby

Dr Heidi Norman

Associate Professor Dr Donna Odegaard AM

William Quinn

Suzanne Thompson

Kisani Upward

Tilda Wise

Andrew Watkins

Roland Wilson

Yardhura Walani National Centre for Aboriginal and Torres Strait Islander Wellbeing Research, ANU

We would also like to thank the following people and communities for their contribution to the case studies used in this report.

- Saibai and Boigu island communities. Case study source: (Australia State of the Environment, 2021).
- Community of Tingha (Nucoorilma Mob). Case study sourced from Kisani Upward and the 'Guwiinbarraan: Close to Fire' Project.
- Wilya Janta Community. Case study sourced from Simon Quilty and the Wilya Janta Community.
- Communities across New South Wales and Victoria: Tenterfield, Clarence Valley, Eurobodalla, and East Gippsland. Case study source: Fire to Flourish Program.
- Yorta Yorta community. Case study source: (Australia State of the Environment, 2021)

Executive summary

Overview

In the context of the National Climate Risk Assessment (the 'National Assessment'), the Aboriginal and Torres Strait Islander Peoples system refers to the First Peoples of Australia and their interconnectedness with the land, sea, and Country. It encompasses Aboriginal and Torres Strait Islander peoples' Lore, customs, cultures, and ways of being, which are all intrinsically linked to the survival of both peoples and ecosystems. These traditional knowledges must be valued to work towards mitigating climate risks.

There have been ongoing impacts on Aboriginal and Torres Strait Islander peoples' knowledge systems and on land, sea and Country and this is being amplified by climate change thus increasing the threat to cultural continuity. This is demonstrated by the fact that climate change disproportionately affects Aboriginal and Torres Strait Islander peoples, contributing to poor health and social and economic life outcomes.

Despite these challenges, the focus on Aboriginal and Torres Strait Islander peoples self-determination, cultural governance and place-based responses provides the foundation for Aboriginal and Torres Strait Islander peoples – the world's oldest living culture – and Australia to respond and adapt to the impacts of climate change, which are already being experienced by some communities.

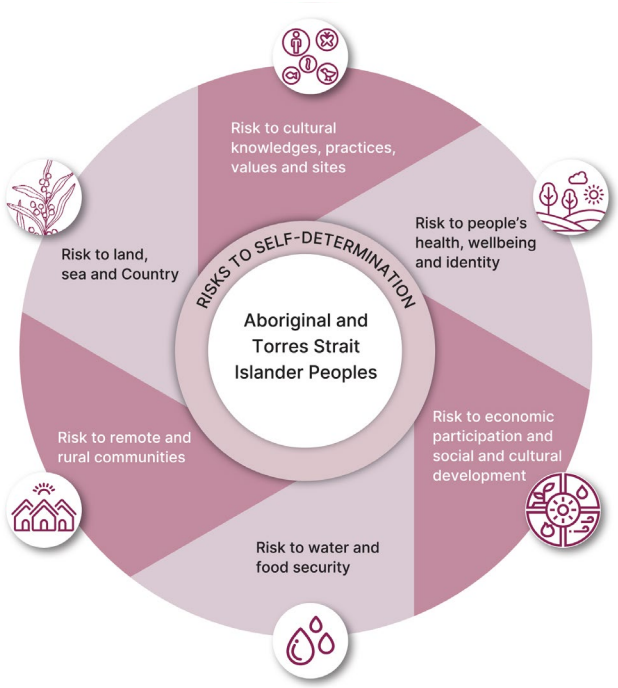


Figure 1: Major risks to Aboriginal and Torres Strait Islander peoples from the changing climate

The nationally significant risks and their framing presented here (Figure 1) have been codeveloped with Aboriginal and Torres Strait Islander people. This work is an extension of the engagement initiated during the first pass. Codesign, led by Prof. Phil Duncan, was supported through gatherings, and meetings with representatives. Case studies and storylines are used in this report to bring to life the experience of Aboriginal and Torres Strait Islander peoples and examples of the adaptation programs underway.

Key Risks

Risk to self-determination, whereby Aboriginal and Torres Strait Islander peoples' right to freely pursue their economic, social and cultural development is at risk due to their disproportionate experiences of the effects of climate change and lack of inclusion in decision-making in connection to caring for Country and climate adaptation strategies. This is an interconnected risk that compounds other key risks.

Risk to land, sea and Country (natural environments, biodiversity, ecosystems) through the changing climate, increased extreme weather events and rising, warming waters that impact biodiversity, cultural sites, communities and settlements.

Risk to cultural knowledges, practices, values and sites due to climate change impacts on Country and through climate action increasing opportunities for biopiracy.

Risk to people's health, wellbeing and identity from the effects of climate change. This causes increased prevalence and acuity of mental and physical health conditions from Country being sick, as well as displacement from Country due to extreme weather.

Risk to economic participation and social and cultural economic development for Aboriginal and Torres Strait Islander peoples, communities and nations from climate-related hazards and their impacts.

Risk to water and food security as waterways are integral to the quality, longevity, and cultural way of life for Aboriginal and Torres Strait Islander peoples. Therefore, the disruption of waterways and related infrastructure due to climate events can have harmful, far reaching and long-term effects.

Risk to remote and rural communities, which are exposed to increased risks as climate hazards and events increase interruptions to water, energy, medical and telecommunication infrastructure and reduce food and water security through diminished road, air and water access.

Key opportunities

Support Aboriginal and Torres Strait Islander peoples' self-determination

Empower Aboriginal and Torres Strait Islander communities to lead climate responses and manage some of the risks that directly impact them.

Promote Aboriginal and Torres Strait Islander governance

Facilitate Aboriginal and Torres Strait Islander peoples led decision-making for environmental and on-Country management.

Integrate and value traditional knowledges to support climate adaptation

Combine Aboriginal and Torres Strait Islander peoples' knowledge systems with scientific methods for holistic climate adaptation approaches for the shared benefit to the nation.

Enhance health of country

Utilise integrated practices to improve ecological resilience in the face of climate change.

Build evidence and data

Build and collect quantitative data, led by Aboriginal and Torres Strait Islander peoples, to support understanding and integration of Aboriginal and Torres Strait Islander peoples' knowledge.

System Overview

The Aboriginal and Torres Strait Islander Peoples system refers to the Indigenous peoples of Australia and their interconnectedness with the land, sea, and Country. It encompasses Aboriginal and Torres Strait Islander Lore, customs, cultures, and ways of being, which are all intrinsically linked to the survival of both peoples and ecosystems.

Valuing Traditional Knowledges

Aboriginal and Torres Strait Islander peoples have a deep-rooted connection to the land, sea, and Country, which is central to their identity, culture, and spirituality. This interconnectedness is reflected in their traditional knowledge systems, which have been honed over millennia and must be recognised and valued to minimise the risks posed by climate change and strengthen adaptation efforts. Ngapartji Ngapartji, in the language of the Iningai people, is one concept related to this way of being. The Iningai people are the traditional custodians of the land in Central West Queensland, around Longreach and the Thompson River catchment. The words were provided by Suzanne Thompson, who has permission from the Iningai Elders to share their use.

Ngapartji Ngapartji speaks to the concept of reciprocity central to many Aboriginal and Torres Strait Islander peoples' ways of being. It speaks to the reciprocal care Country gives people, if people give to it, and the reciprocal nature of giving many Aboriginal and Torres Strait Islander peoples practice with others.

Internationally, the Intergovernmental Panel on Climate Change (IPCC)'s work has increasingly acknowledged the significance of Indigenous peoples' knowledge systems in understanding and addressing climate change (IPCC, 2022). Within an Australian context, Aboriginal and Torres Strait Islander people's traditional and cultural science has long been undervalued. There is significant opportunity to further value this traditional and cultural science in understanding and caring for Country.

The Gatherings held through the co-design process for this system identified that Aboriginal and Torres Strait Islander people's traditional and cultural science should be valued as equal to Western science. The work to equally valuing cultural science should include upholding the rights of Aboriginal and Torres Strait Islander peoples through self-determination, meaningful participation in decision-making processes related to climate policies, respect for and protection of their traditional lands and utilising their traditional knowledge to develop sustainable and resilient communities (United Nations, 2007).

Empowering Cultural Continuity

Aboriginal and Torres Strait Islander traditional ecological knowledge, like stories, has been passed down from generation to generation and continues until today. This has allowed Aboriginal and Torres Strait Islander peoples to live in symbiotic relationships with the land and water: "We used it, we lived from it, we nurtured it" *(Quote from consultation participant, used with permission).* As the world's oldest continuing culture and as custodians of the environment, Aboriginal and Torres Strait Islander peoples' adaptation has been a feature of history for thousands of years.

The dispossession of Aboriginal and Torres Strait Islander peoples' lands, mismanagement of lands and waters, and disregard for culture, knowledge and understanding have contributed to detrimental effects on Aboriginal and Torres Strait Islander peoples and the environment. This sentiment is reflected in the following statement shared by a consultation participant: "We exist in harmony and in pain with our traditional countries." (*Quote from Prof. Phil Duncan, used with permission*).

Since First Contact there has been significant loss of access to Country, species, and totems, as well as significant disruption to the ongoing practice of culture and renewal relationships with places and living things. Since then, adaptation has continued to be a feature of Aboriginal and Torres Strait Islander peoples' survival and needs to continue.

Valuing Self-determination

The work of the IPCC has highlighted the disproportionate impacts and vulnerability on Indigenous peoples' ways of life, health and wellbeing, food and water security, and economic livelihoods (IPCC, 2022). Many Aboriginal and Torres Strait Islander communities in Australia have long been on the front lines of environmental change, experiencing its effects through altered weather patterns, rising sea levels, and biodiversity loss.

Specifically, climate change poses a significant threat to the health, lands, cultural practices, and economic livelihoods of Aboriginal and Torres Strait Islander peoples, in which significant gaps and disadvantages already exist with non-Indigenous populations. This gap is likely to widen if the risks identified in this document are not adequately addressed. Self-determined approaches to addressing these risks are key to ensuring positive outcomes for Aboriginal and Torres Strait Islander peoples and for Australia.

Aboriginal and Torres Strait Islander peoples must be empowered to lead climate change mitigation and adaptation strategies. This requires Aboriginal and Torres Strait Islander peoples to be afforded cultural governance and autonomy over decision-making processes affecting their lands, waters, and cultures. By prioritising Aboriginal and Torres Strait Islander peoples' self-determination, Traditional knowledges can be harnessed to minimise the risks highlighted in this report. This can be done by creating formal partnerships and engaging in decision-making with Aboriginal and Torres Strait Islander peoples (Priority Reform 1, Closing the Gap National Agreement) The transformation of government organisations to become culturally safe and responsive to the needs of Aboriginal and Torres Strait Islander peoples greatly assists the meaningful support of their self-determination and leadership (Priority Reform 3, Closing the Gap National Agreement) (Department of the Prime Minister and Cabinet, 2020).

Place-based: A national perspective drawn from local experiences

The content in this document is generalised to the national context. However, Aboriginal and Torres Strait Islander peoples' knowledges are place-based, and the perspectives, requirements and actions needed are different for different Country types, geographies and peoples. This localised work is required to align with requirements set out in the United Nations Declaration on the Rights of Indigenous Peoples and the National Agreement on Closing the Gap, which identifies the importance of considering the different situations, particularities, and historical and cultural backgrounds of people from different regions (United Nations, 2007).

Aboriginal and Torres Strait Islander peoples experience climate change in diverse ways. The 2021 Census shows that over a third live in major cities, 15% in remote areas, and around 33% are under the age of 15. These statistics highlight the need for tailored, place-based responses to climate change that consider the unique geographies, communities, and cultural connections of different Aboriginal and Torres Strait Islander groups.

System Interactions

All systems in this National Assessment are interconnected and must be understood holistically. Specifically, the Aboriginal and Torres Strait Islander Peoples system is interconnected with the other systems in a non-linear fashion.

For Aboriginal and Torres Strait Islander peoples, land, sea and Country (listed as "Natural environment" in the other reports of the National Assessment, but here acknowledging the preferred language from the Gatherings), communities and settlements, and health and wellbeing are priorities in responding to a changing climate. Impacts in these systems are likely to reduce the ability of Aboriginal and Torres Strait Islander peoples to fulfil their responsibilities to Country. The inextricable link between Aboriginal and Torres Strait Islander peoples, their values and knowledges and the other systems is illustrated in Figure 2 below.

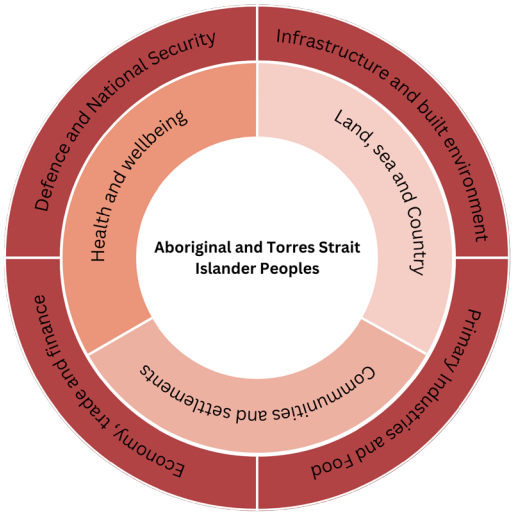


Figure 2: The interconnectedness of systems in the Risk Assessment

An example of the interconnectedness between the Aboriginal and Torres Strait Islander Peoples system and other systems is evident in the natural environment context. In this example, where the natural environment is negatively impacted, this contributes to the destruction of Country, which, in turn, negatively impacts the social and emotional wellbeing of Aboriginal and Torres Strait Islander peoples. A protective factor for social and emotional wellbeing is the protection of and connection to Country. The impact of poor social and emotional wellbeing for Aboriginal and Torres Strait Islander peoples flows on to impact the health and social support system, as Aboriginal and Torres Strait Islander peoples seek to access necessary services and support to address the impact on their social and emotional wellbeing.

The interdependencies between the Aboriginal and Torres Strait Islander Peoples system and the other systems outlined in the National Assessment mean that it is necessary for Aboriginal and Torres Strait Islander peoples' perspectives to be meaningfully included, understood, and reflected in each of the other systems. This is crucial to building understanding and developing effective responses across climate risk and adaptation work now and into the future.

Key Climate Risks

The current and increasingly significant risks to Aboriginal and Torres Strait Islander peoples, their values, and knowledges are summarised in the visual below (Figure 3) and explained in the following sections. While presented at a high level, the risks outlined in the following sections manifest in highly localised ways, impacting diverse Aboriginal and Torres Strait Islander peoples' communities differently. Specific Country types, population demographics, cultural practices, and individual experiences shape these impacts.

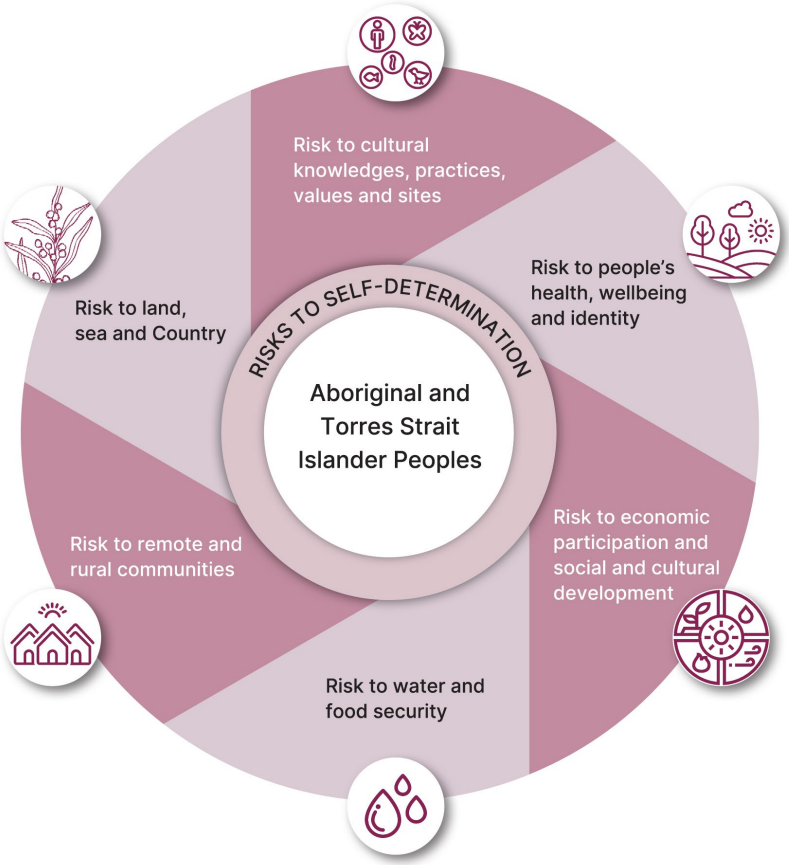


Figure 3: Major risks to Aboriginal and Torres Strait Islander peoples from the changing climate.

Risk to Self-determination

Climate change poses significant risks to the self-determination of Aboriginal and Torres Strait Islander communities. Aboriginal and Torres Strait Islander peoples' right to freely pursue their economic, social and cultural development is at risk due to their disproportionate experiences of the effects of climate change and lack of inclusion from decision-making in connection to caring for Country and climate adaptation strategies.

This is an interconnected risk that compounds other key risks. As climate impacts intensify over time, existing challenges to cultural governance and practices, economic adaptation and social disruption will be exacerbated.

- **Cultural governance and leadership:** Empowering Aboriginal and Torres Strait Islander leadership is vital to sustaining communities and supporting self-determined solutions and includes respect for existing governance mechanisms and cultural protocols. Without this involvement in governance and policy discussions addressing climate change and adaptation, there is a risk of further entrenchment of systemic inequities. Aboriginal and Torres Strait Islander peoples must be afforded the right to assert their cultural governance.
- **Cultural heritage and traditional practices:** The effects of climate change on land and water risk endangering cultural sites, traditions, and knowledges closely tied to the environment. Protecting these elements is essential for self-determination for Aboriginal and Torres Strait Islander peoples.
- **Economic adaptation:** Limited access to resources and opportunities could restrict Aboriginal and Torres Strait Islander peoples' ability to adapt economically to climate change. This could hinder investment in sustainable practices or infrastructure aligned with self-determined development goals.
- **Social disruption:** Climate change threatens community cohesion and health outcomes, impacting the ability of Aboriginal and Torres Strait Islander peoples to maintain cultural practices and remain on Country, therefore undermining their autonomy and self-determination.

Risk to People's Health, Wellbeing and Identity

Risk to people's health, wellbeing and identity from climate impacts includes increased prevalence and severity of physical and mental health conditions. These impacts occur as the result of the declining health of Country and increased extreme weather events, causing social and cultural displacement from traditional Country.

> *"**Aboriginal health**" means not just the physical wellbeing of an individual but refers to the social, emotional and cultural well-being of the whole Community in which each individual can achieve their full potential as a human being thereby bringing about the total well-being of their Community. It is a whole of life view and includes the cyclical concept of life-death-life* (National Aboriginal and Torres Strait Islander Health Organisation, 2024).

Risks to people's health and wellbeing are exacerbated by the following:

- **Extreme weather events:** The impacts on health and wellbeing are dependent on place and are different for different Aboriginal and Torres Strait Islander peoples. In some communities, there will be negative health impacts from rising temperatures, affecting physical and mental wellbeing. In extreme cases, there will be increased deaths from extended heatwaves. In other communities, impacts on mental health from an extended and severe wet season are expected to be significant and may lead to more suicides for those people. Bushfires will also pose an ongoing and increased risk to health for many Aboriginal and Torres Strait Islander peoples, causing long-term health impacts resulting from smoke inhalation and asthma.

- **Housing:** Poorly designed, low quality and unmaintained housing and housing developments increase the impacts of climate change. Common issues are risks from smoke, heat, cold and mould. This can result in overcrowding within houses and increasing homelessness. Climate extremes also exacerbate the housing stock supply. For insights on community led housing programs, see Case study: *Reshaping Housing through Cultural Knowledge: Wilya Janta's Vision for the Future*.
- **Water-borne/insect-borne diseases, including Malaria and Dengue fever:** Extreme temperatures and increased rainfall variability impact waterways and increase the risk of communicable diseases, posing increased risks to Aboriginal and Torres Strait Islander peoples and communities exacerbated by an existing disparity in access to healthcare and burden of ill-health.

Risks to the social and cultural wellbeing of Aboriginal and Torres Strait Islander peoples are also high due to cascading impacts of increasing severe or frequent hazards. These impacts include:

- Risks of disconnection and displacement from Country and community, e.g., communities affected by rising sea levels, unliveable heat, or other extreme events and therefore required to relocate temporarily or permanently to other areas. For further insights, see Case study: *An Indigenist experience of Solastalgia: Nucoorilma Country, Tingha*
- Risks to community wellbeing due to increased instances of racism and interpersonal violence in high temperatures (Mahendran et al., 2021) and decreasing social cohesion due to conflict over resources or displacement.
- Risks to health and wellbeing are likely to worsen due to the inability to access bushfoods and traditional medicines due to climate changes.

The social determinants of Aboriginal and Torres Strait Islander peoples' health and wellbeing are at greater risk in remote and rural communities where there is often greater decision-making pressure resulting from people having to choose between specific health and wellbeing necessities.

Case study: Reshaping Housing through Cultural Knowledge: Wilya Janta's Vision for the Future

This case study highlights a program bringing the skills to design and build appropriate housing for lived realities, and community needs.

For thousands of years, First Nations people have lived in harmony with the harsh and ever-changing climates of Northern Australia. Their knowledge of the environment, passed down through generations, holds solutions that are not just practical but deeply sustainable. Wilya Janta stands at the intersection of this wisdom and the urgent need for housing justice, transforming how homes are designed and built in remote areas.

Listening to the Voices of First Nations People

"Our country means a lot to us, more than anything, and the country tells us many things," says Norman Frank Jupurrurla, a Warumungu Elder. "The Manu—the plants, the trees, and the animals—tell us what season it is, what we have to do, and what's coming. The country will tell you what's happening."

These insights are foundational to Wilya Janta's work. By engaging directly with Aboriginal communities, Wilya Janta leverages cultural knowledge to create housing solutions that respect both the environment and the lived realities of the people.

Housing Justice and Design Innovation

Remote Aboriginal communities face some of the harshest living conditions in Australia. Overcrowded and poorly ventilated homes exacerbate health problems, from heat stress to respiratory illnesses. "These houses have been built for England or somewhere, cold country," reflects Norman Frank. "We need houses to be built for this weather that are made for this climate here today."

Wilya Janta's designs prioritize passive cooling, natural ventilation, and community-driven layouts (Figure 4). Homes elevated on stilts, with wide verandas and solar-powered energy systems, align with the needs of these regions. This approach not only mitigates the effects of extreme heat but also reduces reliance on energy-intensive air conditioning.

Figure 4: Artist's rendition of the new Wilya Janta house (Credit: Andrew Quilty and Simon Quilty)

Building with Cultural and Environmental Integrity

“We’d sit right on the side in the shade all day,” Norman Frank recalls. “We’d hunt or set traps in the evening when it’s cool and get it early the next morning. Now we’re just watching these hot days that are getting hotter more often and for longer.”

Wilya Janta’s approach honours this connection to the land. Every design and construction decision is guided by Aboriginal cultural consultants, ensuring the integration of traditional knowledge. By training community members to lead these efforts, Wilya Janta creates employment opportunities and fosters local expertise in housing design and evaluation.

A Platform for Advocacy and Change

“If you want to eat conker berries, you’ve got to shake the bush,” Norman Frank explains. “That’s how we get the government and Papulanyi to listen to us—shake the bush till the fruit hits the ground.”

Wilya Janta has become a powerful advocate for housing justice, hosting parliamentary seminars and collaborating with Aboriginal Housing NT to propose design guidelines. The project’s influence is already evident in policy shifts, such as the adoption of higher energy efficiency standards (NatHERS >5.0) for new housing in the Northern Territory.

A Vision for the Future

As climate change intensifies, the lessons from Wilya Janta’s work are invaluable. “Today, we still live like we used to live in humpies,” says Norman Frank, “because our houses are poor and overcrowded.” Through innovative housing solutions rooted in cultural knowledge, Wilya Janta aims to reverse this narrative, ensuring that Aboriginal people have homes that are not just shelters but spaces for thriving.

“What I want on a hot day is a fan, a fridge, safe, clean, reliable water, and shade,” Norman Frank concludes. “That’s all we need. That’s all you need when it’s really hot—not a tin house.”

Wilya Janta’s journey is far from over, but its impact is already reshaping the landscape of housing in Northern Australia. By centering the voices and wisdom of Aboriginal people, Wilya Janta not only addresses immediate housing needs but also offers a model for sustainability and cultural integrity in a warming world.

Acknowledgements: Thanks to the Wilya Janta Community. Case study sourced from Simon Quilty and the Wilya Janta Community. Quotes from Norman Frank used with permission.

Case study: An Indigenist experience of Solastalgia: Nucoorilma Country, Tingha

The mental health and well-being impact of a changing climate affects everyone differently. This case study highlights the experience of the community of Tingha (Nucoorilma Mob) and the importance of community led and culturally relevant approaches to resilience and recovery.

Solastalgia refers to “distress produced by environmental change impacting people while they are directly connected to their home environment” (Albrecht et al., 2007). The term, coined by environmental philosopher, Professor Glenn Albrecht, emerged in the Hunter Valley in response to the accounts of local community members, both Indigenous and non-Indigenous, who struggled to articulate the grief they felt witnessing the destruction of their lands by the mining industry. Although solastalgia has yet to gain formal recognition in psychology, it is understood within the broader field of 'psychoterratic' states, which explores the emotional responses one has in association with Earth. For Aboriginal and Torres Strait Islander communities, grief over the degradation of Country is profound, as Country is seen as a living, interconnected part of the community rather than merely land.

Kisani Upward, a registered nurse and PhD candidate, has been examining the experiences of solastalgia within the Aboriginal community of Tingha (Nucoorilma Mob) following the 2019-2020 Black Summer bushfires. The Tingha Plateau fire burned for nearly four weeks in February 2019, ravaging close to 25,000 hectares of land, 14 homes and damaging 40 outbuildings (NEMA & AIDR, 2019).

During her research, Kisani found that the term 'solastalgia' was unfamiliar to the Nucoorilma Mob, however, the emotional experiences that it captured—grief, loss, and disconnection from Country—were deeply understood. This project, titled 'Guwiinbarraan: Close to Fire', aimed to explore these experiences by inviting the community to participate as co-researchers, engaging in storytelling through culturally relevant mediums such as art, yarning and photography. This approach allowed the Nucoorilma Mob to document both the physical changes to their landscape and the accompanying emotional and cultural impacts. During their frequent on-Country excursions, the Elders often recounted growing up on Country and how their relationship with Country has been increasingly disrupted by climate change.

The Nucoorilma Mob likened the grief they felt for the damaged Country to heartbreak, equivalent to the sickness or loss of a family member, as Country is an extension of their community and identity. Connection to Country is an intrinsic part of Indigenous identity and wellbeing; witnessing its destruction profoundly affected the community. A powerful moment in the project occurred when the Nucoorilma Mob returned to several sacred sites that had been inaccessible due to systemic red-tape and later, fire damage. Elders taught younger generations how to locate ochre pits and prepare the ochre for traditional body painting – an experience many community members had never had.

This reconnection to Country was transformative, providing a sense of healing amidst the devastation caused by the fires. However, the Nucoorilma Mob were left grappling with how to provide the same healing to Country, becoming collectively resilient and strong. Healing Country requires sustainable funding, grant support and ranger programs that provide the community with income while they engage in this work.

However, low socio-economic status communities face significant barriers in maintaining these initiatives. Limited resources, training, and community capacity for applying for grants, coupled with often limited support from local councils for Aboriginal-led projects, hinder these efforts. Despite their broader positive impacts on community wellbeing, these programs struggle to secure the necessary backing.

In the face of these challenges, the Guwiinbarraan Project provided hope to the Nucoorilma Mob in two fundamental ways. First, it reinforced the resilience that comes from reconnecting to Country, recognising the healing power this connection holds. Second, the project demonstrated that, with appropriate support, programs like these can assist Aboriginal communities in recovering from traumatic climate events such as bushfires, through the process of healing Country. Moreover, it highlights the importance of place-based approaches to disaster recovery, recognising that Indigenous knowledge and engagement are vital in both disaster prevention and recovery efforts. For the Nucoorilma Mob of Tingha, art, yarning, and reconnection to Country became essential tools in processing grief, addressing solastalgia, and facilitating collective healing following the bushfires.

The Guwiinbarraan Project demonstrated that community-led, culturally relevant approaches to healing Country can have transformative impacts on both the land and the people who depend on it. As climate change and environmental degradation continue to impact rural and remote communities, Indigenous-led initiatives like these offer valuable insights and strategies for fostering resilience and recovery, in ways that honour cultural identity and the importance of Country.

Acknowledgements: Thanks to the community of Tingha (Nucoorilma Mob). Case study sourced from Kisani Upward and the 'Guwiinbarraan: Close to Fire' Project.

Risk to Land, Sea and Country

Risks to land, sea and Country through the changing climate will negatively impact natural environments, biodiversity and ecosystem functions. This occurs because of increased extreme weather events, such as increased frequency and intensity of bushfires, and chronic change including increased temperatures, altered rainfall patterns and rising and warming waters. These changes will impact biodiversity and animals such as birds, bats, bees, and insects and there will also be destruction and harm caused to cultural sites. See Case study: *Sea level rise and the Torres Strait Island*.

These risks are widespread, encompassing coastal and marine environments, rivers, lakes, freshwater ecosystems and terrestrial landscapes, and include:

- threatened marine ecosystems
- increased water scarcity as rainfall variability increases
- altered aquatic ecosystems and wildlife habitats
- increased instances of stagnant water
- changed water flows
- increased black water deoxygenation events and moving riverbanks, which affect native fish and plant species
- increased events of blue-green algae blooms

For further information see the Case study: *Yorta Yorta weaving*.

The impacts of the overuse of resources (mining and farming) have already changed Country, its ecosystems and biodiversity. Climate change and emission reduction programs can exacerbate such damage and increase demand for critical minerals. Moreover, the changes to Country also impact cultural practices, knowledges and values as the access, timing, connection to Country and totemic species are at risk.

"Heal our land, heal our Country" Consultation participant (used with permission).

Risks to land, sea and Country may be exacerbated if cultural and place-based knowledges are not valued in mitigation and adaptation strategies or are lost as the climate changes. Slow responses to healing Country will lead to further damage, impacting cultural practices.

Case study: Sea level rise and the Torres Strait Island

Community run programs are implementing strategies to limit the impacts of our changing environment, enabling communities to remain viable. This case study on the impacts of sea level rise in the Torres Strait Islands, shows the need for ongoing support and partnership with government.

Parts of the Torres Strait Islands are highly vulnerable to sea level rise. A number of the islands are very low lying, and coastal inundation and erosion are significant issues even in the current climate. The most acute issues cover 2 groups of islands: the 2 alluvial islands in the top western region (Boigu and Saibai) and a number of small coral cays in the central part of the Torres Strait islands.

In the top western islands, there have been several inundation events since 2005. In 2011, during a strong La Niña event, some inhabited areas of Saibai were inundated to a depth of up to 0.5 metres (Systems Engineering Australia, 2011). Some of the central coral cays have experienced significant coastal erosion. In addition to direct impacts on inhabited areas of the islands, these events threaten graves and other significant cultural sites, as well as saltwater intrusion into landfills, wastewater treatment sites and groundwater. Although tropical cyclones are relatively rare in the islands compared with areas further south in northern Queensland, storm surge associated with tropical cyclones is another potential risk.

Observed rates of sea level rise in the region over the period 1993–2010 were about 6 millimetres per year, somewhat greater than the global average of 3–3.5 millimetres per year and consistent with a broader pattern of increased sea level rise in the western tropical Pacific over this period. It is as yet unclear what contribution, if any, variability in the behaviour of the El Niño–Southern Oscillation (particularly the predominance of La Niña in the late 2000s and early 2010s) has made to this locally increased sea level rise, and whether it is likely to be sustained. Planning in the islands is widely based on projected sea level rise of 0.8 metres by 2100 (Green et al., 2010; Rainbird, 2016; Suppiah et al., 2011; TSRA, 2014).

Significant works to adapt to sea level rise are already taking place. New seawalls have been completed on Saibai and Boigu islands, replacing earlier community-built seawalls that had previously failed, as well as on Poruma Island in the central coral cay region. Further seawalls are in the planning stage. It is expected that, with such infrastructure works, existing communities will remain viable for at least several decades. Relocation of communities to other islands is regarded as a highly culturally disruptive option and would be considered only as a last resort.

Acknowledgements: Thanks to Saibai and Boigu island communities. Case study source: (Australia State of the Environment, 2021)

Case study: Yorta Yorta weaving

Cultural practices and ways of living are at risk due to our changing climate. This case study shows how empowering communities to develop adaptation strategies using traditional knowledge and practices and research efforts is yielding results.

A changing climate, changing water management practices and environmental change are all impacting the way in which the Yorta Yorta people access, harvest and use one of their traditional weaving sedges (Carex tereticaulis). Most of their Country is developed; land-use activities vary from multiple crop species of wheat and corn to dairy farms.

The weaving sedge is an ephemeral aquatic species that relies on regular seasonal watering from the Murray River, its associated waterways and rainfall. It grows throughout the area, known as Barmah. The Yorta Yorta people refer to this area as Pama.

The weaving sedge relies on multiple factors to maintain conditions that are favourable for healthy growth, such as inundation with water, soil health, climate and rainfall. A changing climate and changing water regimes are affecting the resilience of this species and, therefore, the availability of this important plant for traditional knowledge and cultural use by the Yorta Yorta people. Records show 2 important climatological events in south-east Australian history: the ‘federation drought’ at the turn of the 20th century and the ‘millennium drought’ at the turn of the 21st century (Griggs et al., 2014). They also show that a pattern of episodic flooding was evident before settlement and that cultural uses of traditional plant species were affected by these drier episodes (Griggs et al., 2014).

The impacts of low rainfall, hotter summers and a changing climate are evidence that these species are struggling to survive. This means that the Yorta Yorta people cannot harvest at this site and use the species in the same traditional setting as they had once done. Yorta Yorta Country and the weaving sedge are forced to adapt to change, and the Yorta Yorta people are forced to adapt as a result of these changes:

If this plant is no longer available on Country, then my connection to my heritage and our traditional practices have been impacted. If the plants are healthy, we can harvest the reed for weaving. If the plants are not healthy, the reeds won’t be healthy and cannot be used. This tells us that there is something wrong. This is our barometer check of healthy Country. (Denise Morgan-Bulled, 2020).

While improved water management and rainfall are seen as critical to supporting the weaving sedge, fire was recently applied to the sedge to see whether the recovery of this species was possible under adapted conditions:

To see Country burn – I felt a sense of calm; to see and feel fire – my skin felt good; to see and smell smoke – I felt I could breathe; to stand on Country – I felt strong. Country felt good that day, I felt good that day. (Sonia Cooper, 2020).

Immediately after the burn, rain fell and some parts of the forest were inaccessible, and some new growth was triggered. This project allowed the influence of fire to be investigated as an additional management tool to help recover the species. The response of the weaving sedge to fire provided cultural outcomes for traditional weaving species for the Yorta Yorta people.

Acknowledgements: Thanks to the Yorta Yorta community. Case study source: (Australia State of the Environment, 2021)

Risks to Water and Food Security

Waterways are central to the quality, longevity, and cultural way of life for Aboriginal and Torres Strait Islander peoples. Hence, diminished water and food quality and security due to climate change and its effects on related infrastructure will disproportionately impact Aboriginal and Torres Strait Islander peoples.

Droughts, heat waves, changing rainfall patterns, and rising sea levels affect the supply, access, and quality of potable water for Aboriginal and Torres Strait Islander peoples. Reduced water security also impacts access to safe drinking water sanitation and hygiene "wash water" is crucial to the health and wellbeing of Aboriginal and Torres Strait Islander peoples who are living within remote and rural communities. With the compounding impacts of climate change, underground water sources and aquifers are running dry and may not be replenished, further limiting access to water or contaminating existing water sources.

In addition, changing ecosystems significantly impact Aboriginal and Torres Strait Islander peoples' access to and the quality of traditional food sources, such as bush foods, fish, and shellfish species. Climate change-driven disruptions, like rising sea levels, altered rainfall patterns, and increased temperatures, can damage habitats and reduce the availability of these vital food resources. This leads to greater food insecurity, as traditional diets and cultural practices are closely tied to the land and sea. As the availability of bush foods and marine life becomes more unpredictable, communities may face increased reliance on store-bought food, which is often less nutritious and more expensive, further exacerbating health and economic challenges. These changes also undermine cultural practices and knowledge related to food gathering, creating additional stress on Aboriginal and Torres Strait Islander communities.

Risk to Economic Participation and Social and Cultural Economic Development

Climate-related hazards and their impacts drive risks to economic participation and social and cultural economic development for Aboriginal and Torres Strait Islander peoples and communities.

Economic participation and development risks exist across all industries, including tourism, commercial fishing and cultural and conservation economies where place-based employment opportunities rely on the health of Country. There are also risks to Aboriginal and Torres Strait Islander peoples' economic opportunities in expanding climate change-related economies, such as opportunities in bush foods, the renewable energy transition, biodiversity credits, the Nature Repair Market, and Australian Carbon Credit Units (ACCU) schemes. There is potential for adverse impacts for Aboriginal and Torres Strait Islander peoples due to a lack of adequate representation and resourcing in nature related schemes, this points to the importance of Aboriginal and Torres Strait Islander representation in scheme governance and participation (Chubb et al., 2022).

Risk to Cultural Knowledges, Practices, Values, and Sites

Risks to cultural knowledges, practices, values, and sites due to external climate impacts on Country and through action on climate change increasing opportunities for biopiracy.

Changing climate conditions risk damaging cultural sites and limiting the ability of Aboriginal and Torres Strait Islander peoples to connect to Country. This includes risks to the roles and responsibilities of individuals and communities to meet cultural protocols and customs and to partake in practices due to the changing climate limiting access or increasing damage to Country; for example, a community may be unable to care for Ancestral remains due to damage to a cultural site. Changing climate and weather patterns and seasonality affect Traditional knowledges of the appropriate timing of cultural practices and ceremonies and can limit access to sites at the appropriate time.

These risks are compounded when considering the role of Elders in sharing practices and knowledge, the importance of intergenerational transmission of Lore to younger generations, as well as the maintenance of cultural practices and languages. Key activities include strengthening knowledge for all people, introducing culture to young people, helping Aboriginal and Torres Strait Islander peoples reconnect to their country and culture. The risk of temporary or permanent displacement makes it harder to maintain and transmit cultural practices.

The changing climate poses a significant risk to Aboriginal and Torres Strait Islander peoples' identities, which are deeply intertwined with the land, sea, and cultural practices. As the impacts of climate change will disrupt traditional knowledge systems, songlines, and totemic species, the very foundations of Aboriginal and Torres Strait Islander peoples' identities will be threatened. The erosion of these cultural elements can lead to a loss of connection to Country, a diminished sense of belonging, and an erosion of cultural continuity.

There is also an increased risk of cultural knowledge and intellectual property theft (biopiracy) due to the demand for knowledge needed to reduce climate change and adapt. Biopiracy risks Aboriginal and Torres Strait Islander peoples losing the tangible benefits of sharing biodiversity-related expertise, if they are not acknowledged or adequately remunerated for the service of providing this knowledge.

Risk to Remote and Rural Communities

Aboriginal and Torres Strait Islander peoples living in remote and rural communities are exposed to increased risks. These result from climate hazards and events that destroy water, energy, medical, and telecommunication infrastructure and reduce food and water security through diminished road and air access.

Aboriginal and Torres Strait Islander remote and rural communities have increased vulnerability to climate hazards due to limited infrastructure or options to seek refuge from environmental hazards or extreme events. The reliance on extended connecting infrastructure to support freight, telecommunications, health and medical support is also a vulnerability. Rural communities in areas such as the Northern Territory, where increased weather during the wet season isolates communities, are particularly exposed to climate risk.

These risks for Aboriginal and Torres Strait Islander peoples are compounded by health risks in remote locations from poor housing infrastructure, unreliable access to reliable power, potable water insecurity, and distance from medical resources.

Aboriginal and Torres Strait Islander Peoples' Opportunities

Aboriginal and Torres Strait Islander peoples and communities are actively engaged in national, state, and local dialogues on climate change. They have a strong voice and are committed to addressing these challenges and are involved through forums such as the First Nations Clean Energy and Climate Change Advisory Committee, the Indigenous Advisory Committee to the Minister for the Environment and Water, the National First Peoples Platform on Climate Change, supported by the National Environment Science Program, and the Aboriginal Community Controlled Health Sector operating across Australia.

The opportunities in the Aboriginal and Torres Strait Islander Peoples system are outlined below.

Empower and Promote Aboriginal and Torres Strait Islander Peoples Self-determination and Governance

In line with the guiding principles of the National Assessment, recognising, respecting and empowering Aboriginal and Torres Strait Islander peoples as the Traditional Owners and custodians of Country is essential for a successful risk assessment process and adaptation policy development. This involves supporting self-determination for Aboriginal and Torres Strait Islander communities and enabling Aboriginal and Torres Strait Islander-led responses to climate change. Robust decision-making mechanisms, such as the First Nations Clean Energy and Climate Change Advisory Committee, empower Aboriginal and Torres Strait Islander peoples self-determination by ensuring they have a voice in critical decision-making processes.

By embedding Aboriginal and Torres Strait Islander leadership into decision-making structures, such as renewable energy initiatives and climate adaptation programs, their expertise and knowledge can be better utilised to drive meaningful and lasting change. This leadership process must also consider cultural protocols and the inclusion of appropriate knowledge holders.

In addition, Aboriginal and Torres Strait Islander communities and organisations across Australia have created numerous Caring for Country plans. This work needs to be amplified to continue this vital work of communities and organisations and effectively respond to climate change.

Resourcing is required to support the leading Aboriginal and Torres Strait Islander representative bodies, such as Local Aboriginal Land Councils, in developing climate change strategies. Representative bodies need support to engage members and develop localised, place-based strategies, including projection data on how their local Country could be affected.

Integrate and value Traditional Knowledges to support climate adaptation

Aboriginal and Torres Strait Islander traditional ecological knowledges offer valuable insights and guidance for addressing climate-related challenges. See Case study: *Empowering Indigenous Communities for Disaster Recovery*.

Combining Aboriginal and Torres Strait Islander peoples' knowledge systems with scientific methods is crucial to achieve holistic climate adaptation approaches for Australia. For example, incorporating Aboriginal and Torres Strait Islander land management practices, such as cultural burning, could enhance sustainable environmental outcomes.

Case study: Empowering Indigenous Communities for Disaster Recovery

Working together to support community-lead recovery and adaptation solutions enables the integration of research and traditional knowledge, while empowering communities and streamlining access to resources and skills.

Fire to Flourish is a community-led initiative to support climate disaster recovery and resilience-building initiatives in Indigenous communities. It was established in the wake of the 2019-2020 bushfires in New South Wales, as services struggled to meet the needs of affected communities. The program provides funding and resources to four communities to design and implement their own recovery initiatives. Its approach is collaborative, people-focused, place-based and unique to each community's needs and priorities.

The program streamlines funding application and acquittal processes, making it easier for communities to access support and implement their projects. This focus on efficiency and accessibility ensures that resources are delivered where they are needed most when they are needed most.

"The Fire to Flourish approach helped me to see beyond the restraints of what we had been through, and to look at and dream about a more positive future." Community Co-Designer

Fire to Flourish demonstrates the power of community-led solutions to adaptation in the face of a changing climate. This empowers communities to identify and address their most pressing needs, whether that is rebuilding infrastructure, restoring cultural practices or creating employment opportunities that contribute to people staying in community.

The program has partnered with four communities across New South Wales and Victoria (Tenterfield, Clarence Valley, Eurobodalla, and East Gippsland). These local government areas were selected after the 2019-20 bushfires based on the burnt area, number of properties destroyed, socio-economic disadvantage and because these communities have an above-national-average Aboriginal population.

"The appreciation of Aboriginal culture in [the program] is making a difference to the way people are treating us." Community Lead, Tenterfield

One of the most impactful initiatives implemented across all four partner communities is cultural burning, which is known to reduce the risk of bushfires, contribute to plant regrowth, and improve ecosystems. Empowering Indigenous-led, proactive management of Country allows community preparedness and responsibility for their own recovery efforts.

Each community is supported to co-design its own disaster recovery and resilience initiatives. Fire to Flourish provides funding for the chosen projects and offers capability and skill-building support to implement them.

"It's an honour to work so closely with community and know there's going to be tangible outcomes for them." Community Co-lead, East Gippsland

Community members are employed to form co-design groups that can apply for funding for resilience projects and future strategies.

The program is partnered with Monash University, Paul Ramsay Foundation, Metal Manufactures Pty Ltd, the Lowy Foundation and the Australian Centre for Social Innovation. Fire to Flourish and Monash University partner to conduct academic research to measure the impact of these initiatives. This research identifies areas for improvement, which can then be implemented in future efforts to support communities experiencing other types of climate disasters, such as floods.

Acknowledgements: Thanks for the participation from four communities across New South Wales and Victoria: Tenterfield, Clarence Valley, Eurobodalla, and East Gippsland. Case study source: Fire to Flourish Program.

Enhance Health of Country

Aboriginal and Torres Strait Islander-led environment and conservation projects have benefits across environments, social, cultural and economic domains. These projects, such as the Indigenous rangers' program or tourism operations, provide economic development opportunities for Aboriginal and Torres Strait Islander peoples and communities. Aboriginal and Torres Strait Islander peoples deeply understand the rapid changes occurring on Country and the urgent need for adaptation. Increased financial commitments may be required to continue these economic opportunities within a changing climate.

If adequate support and recognition are in place there are opportunities to enhance market participation for Aboriginal and Torres Strait Islander peoples through initiatives like the Australian Carbon Credits Units (ACCU) scheme or Nature Repair Market. Additionally, there is potential for significant improvements in remote community energy and housing situations through increased investment, national regulation, community-controlled solutions, and housing designs that align with cultural and climate needs.

As the IPCC states, climate-resilient development is enabled when actors make inclusive development choices that prioritise risk reduction, equity, and justice and when decision-making processes are integrated. It's facilitated by working in partnership with Aboriginal and Torres Strait Islander peoples, and these groups need to be supported by political leadership, resources, and financing (IPCC, 2022).

Furthermore, providing Aboriginal and Torres Strait Islander peoples with leadership opportunities, with traditional knowledge and practices appropriately valued, benefits Australian society. This approach will reduce the risks of climate change and provide a more collective, interconnected, cohesive way of living before all Australians.

There is also opportunity for Aboriginal and Torres Strait Islander peoples to lead the development of research and knowledge on the ongoing impacts of climate change. Providing Aboriginal and Torres Strait Islander peoples with a voice in research decision-making will inform the projected effects of climate change on Aboriginal and Torres Strait Islander peoples' futures on Country, the impact on the right to exercise native title rights and interests, and the effects of climate change on the ability to manage lands and waters, fish and hunt, ensuring more effective and equitable adaptation.

Build evidence and data

Traditional knowledges have typically not been valued as much as western scientific knowledge in understanding the changing Australian climate and informing adaptation. There is a critical need to recognise the value of different forms of knowledge and develop ways to integrate Aboriginal and Torres Strait Islander peoples knowledges data alongside quantitative data to address this (New et al., 2022).

Qualitative data within traditional knowledges yields value and utility through Aboriginal and Torres Strait Islanders peoples close connection to Country. Holistic approaches integral to traditional knowledges can contribute to complex problem-solving through the application of fuzzy logic, continued reading of the environment, the collection of large amounts of information and the construction of collective mental models that can adjust to new information. Understanding a large number of variables qualitatively can be beneficial, as opposed to a scientific approach in understanding a small number of variables quantitatively (Abram et al., 2019).

This collaborative approach will enhance our understanding of climate change impacts and has the potential to effectively use all relevant knowledge and inform more effective adaptation strategies, particularly in Aboriginal and Torres Strait Islander communities. By valuing and incorporating traditional knowledges into climate science and policy, more resilient and sustainable futures can be built for all Australians.

References

Abram, N., Gattuso, J. P., Prakash, A., Cheng, L., Chidichimo, M. P., Crate, S., Enomoto, H., Garschagen, M., Gruber, N., Harper, S., Holland, E., Kudela, R. M., Rice, J., Steffen, K., & Schuckmann Von, K. (2019). Framing and Context of the Report. In *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate* (pp. 73–129). Cambridge University Press. https://doi.org/10.1017/9781009157964.003

Albrecht, G., Sartore, G.-M., Connor, L., Higginbotham, N., Freeman, S., Kelly, B., Stain, H., Tonna, A., & Pollard, G. (2007). Solastalgia: the distress caused by environmental change. *Australasian Psychiatry: Bulletin of Royal Australian and New Zealand College of Psychiatrists*, *15*. https://doi.org/10.1080/10398560701701288

Australia State of the Environment. (2021). *Case studies*. https://soe.dcceew.gov.au/climate/case-studies

Bureau of Meteorology. (n.d.). *Indigenous Weather Knowledge*. Indigenous Weather Knowledge. http://www.bom.gov.au/iwk/index.shtml

Chubb, I., Bennett, A., Gorring, A., & Hatfield-Dodds, S. (2022). Independent Review of ACCUs. *Department of Climate Change, Energy, the Environment and Water*. https://www.dcceew.gov.au/sites/default/files/documents/independent-review-accu-final-report.pdf

Clarke, P. A. (2009). Australian Aboriginal Ethnometeorology and Seasonal Calendars. *History and Anthropology*, *20*(2), 79–106. https://doi.org/10.1080/02757200902867677

CSIRO. (n.d.). *Indigenous seasonal calendars*. https://www.csiro.au/en/research/indigenous-science/indigenous-knowledge/calendars

Department of the Prime Minister and Cabinet. (2020). *National Agreement on Closing the Gap*. http://nla.gov.au/nla.obj-2825246596

Green, D., Alexander, L., Mclnnes, K., Church, J., Nicholls, N., & White, N. (2010). An assessment of climate change impacts and adaptation for the Torres Strait Islands, Australia. *Climatic Change*, *102*, 405–433.

Griggs, D., Lynch, A., Joachim, L., Zhu, X., Adler, C., Bischoff-Mattson, Z., Wang, P., & Kestin, T. (2014). *Learning from Indigenous knowledge for improved natural resource management in the Barmah-Millewa in a changing and variable climate*.

IPCC. (2022). *Climate Change 2022: Impacts, Adaptation and Vulnerability. Working Group II Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (B. R. H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem (Ed.)). Cambridge University Press. https://doi.org/DOI: 10.1017/9781009325844

Mahendran, R., Xu, R., Li, S., & Guo, Y. (2021). Interpersonal violence associated with hot weather. *The Lancet Planetary Health*, *5*(9). https://doi.org/10.1016/S2542-5196(21)00210-2

Mallee District Aboriginal Services. (2022). *Our Lore*. https://www.mdas.org.au/files/mdas-our-lore.pdf

McKemey, M. B., Rangers, B., Ens, E. J., Hunter, J. T., Ridges, M., Costello, O., & Reid, N. C. H. (2021). Co-producing a fire and seasons calendar to support renewed Indigenous cultural fire management. *Austral Ecology*, *46*(7), 1011–1029.

National Aboriginal and Torres Strait Islander Health Organisation. (2024). *About Us*. NACCHO. https://www.naccho.org.au/

NEMA, & AIDR. (2019). *New South Wales, February 2019. Tingha Plateau fire, 2019*. Australia Disaster Resilience Knowledge Hub. https://knowledge.aidr.org.au/resources/2019-bushfire-nsw-tingha-plateau-fire/

New, M., Reckien, D., Viner, D., Adler, C., Cheong, S. M., Conde, C., Constable, A., Coughlan de Perez, E., Lammel, A., Mechler, R., Orlove, B., & Solecki, W. (2022). Decision-Making Options for Managing Risk. In *Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (pp. 2539–2654). Cambridge University Press. https://doi.org/10.1017/9781009325844.026

NSW Government Office of Environment and Heritage. (n.d.). *Totems*. https://www2.environment.nsw.gov.au/topics/animals-and-plants/nsw-koala-country/koalas-and-aboriginal-culture/cultural-connections/totems

Prober, S. M., O'Connor, M. H., & Walsh, F. J. (2011). Australian Aboriginal peoples' seasonal knowledge: a potential basis for shared understanding in environmental management. *Ecology and Society*, *16*(2). https://doi.org/10.5751/ES-04023-160212

Rainbird, J. (2016). Adapting to sea-level rise in the Torres Strait. *Case Study for CoastAdapt, National Climate Change Adaptation Research Facility: Gold Coast, Australia*.

Reeve, P. D., West, P., Ward, N., James, M., West, K., Gibson/Nungarrayi, L., Hope, P., & Peter, J. (2023). *Seasonal Calendars: Are the seasons changing? A project by the National Environment Science Program Climate Systems Hub. Poster at Climate Adaptation Conference*.

Suppiah, R., Collier, M., & Kent, D. (2011). Climate change projections for the Torres Strait region. *Proceedings of the 19th International Congress on Modelling and Simulation*, 2775–2778.

Systems Engineering Australia. (2011). *Torres Strait Extreme Water Level Study*. https://www.tsra.gov.au/wp-content/tsra-archive/data/assets/pdf_file/0006/2004/tsewls_finalreport_lowres.pdf

TSRA (Torres Strait Regional Authority). (2014). *Torres Strait Climate Change Strategy 2014–2018*.

United Nations. (2007). *United Nations Declaration on the Rights of Indigenous Peoples*. https://social.desa.un.org/sites/default/files/migrated/19/2018/11/UNDRIP_E_web.pdf

Contact us | acs@acs.gov.au

Visit us | acs.gov.au