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National First Peoples Gathering on Climate Change

Morgan-Bulled D, McNeair B, Delaney D, Deshong S, Gilbert J, Mosby H, Neal DP, et al.; Jackson, Guy

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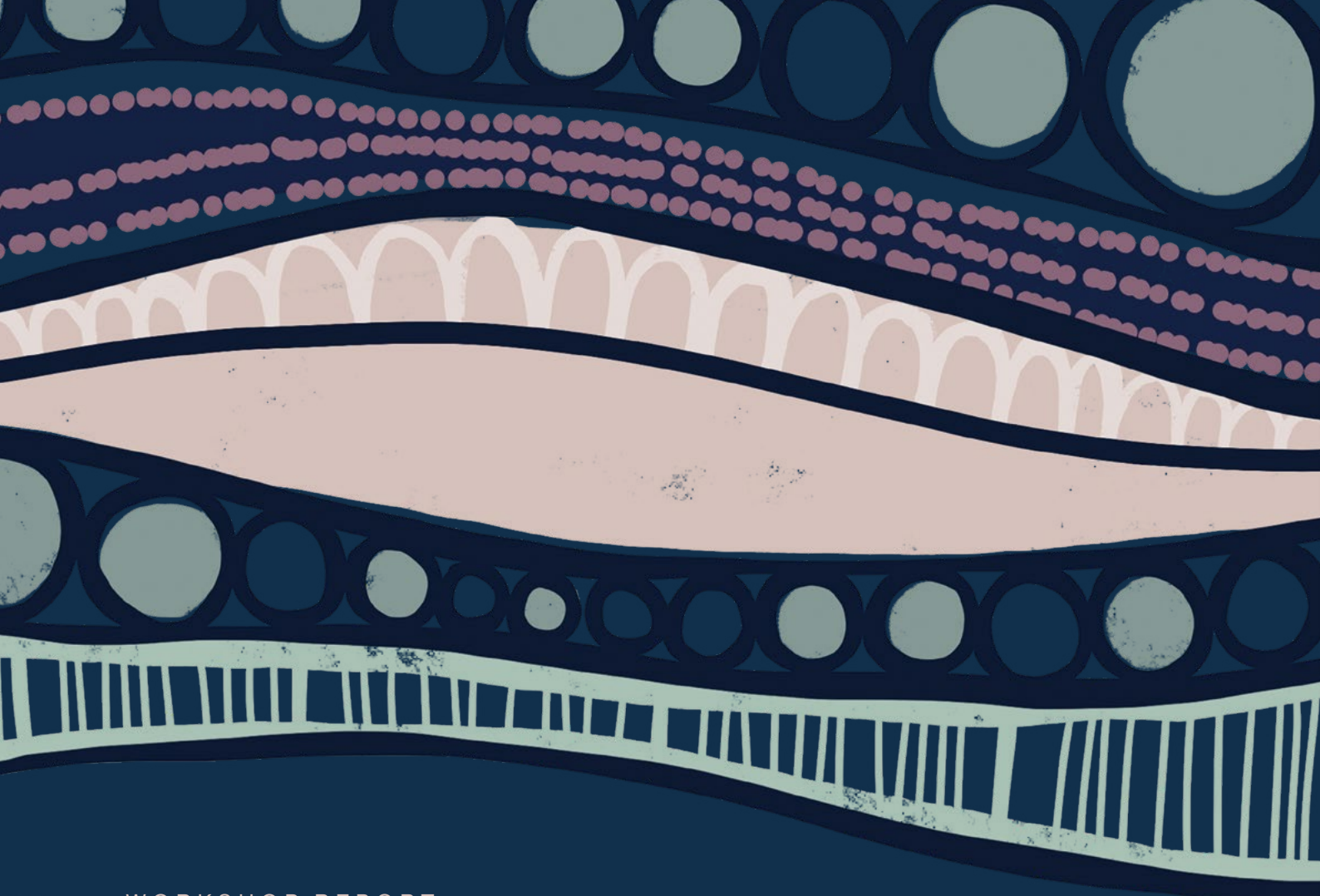
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WORKSHOP REPORT

National First Peoples Gathering on Climate Change

18 June 2021

Earth Systems and Climate Change Hub Report No. 29



Earth Systems and
Climate Change
Hub

National Environmental Science Programme

Morgan-Bulled D, McNear B, Delaney D, Deshong S, Gilbert J, Mosby H, Neal DP, Puntoriero J, Wilson J, Fourmile G, Singleton G, Bullio R, Hill R, Hopkins M, Pearce K, Schmidt S, Sheppard M, Austral B, Baldwin L, Bell N, Bligh P, Bonython-Ericson S, Bradley C, Brandy S, Butler L, Carlise M, Carter M, Catt G, Clohessy S, Clubb R, Clubb T, Cooper S, Cowen T, Ewart A, Fitzpatrick N, Flugge K, Fourmile J, Fraser J, Gardner D, Gould J, Green J, Hapke C, Hooper B, Hughes Z, Hunter B, Hunter C, Joesph D, Kaddy C, Kerinaia M, Ketchell J, King T, Langworthy L, Lawrence M, Lee L, Locke J, Long C, Longcaric H, Longcaric P, Ludwick H, Maluwapi W, Mann N, Markham R, , McGuire O, McNear N, Morgan A, Morgan D, Muller S, Mummery A, Murray P, Neal J, Neal M, Ramsay H, Rattling Leaf Snr R, Rose E, Shelton G, Shovellor-Sesar W, Singleton T, Smith J, Syme L, Talbot A, Talbot L, Tamu K, Tanna R, Taylor S, Telford A, Villaflor S, Webb T, Williams K, Wingfield G, Woosup J, Wren L, Canadell P, Chand S, Chung C, Evans J, Holbrook N, Karoly D, Kirono D, Marsland S, McInnes K, O'Grady J, Graham, LM, Jackson G, Pirzl R, van Velden J, Williams R. 2021. National First Peoples Gathering on Climate Change: Workshop Report.

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Layers of Country by Keisha Leon depicts the story of the ESCC Hub's Indigenous engagement activities: building on the knowledge and history of the Country, both its people and environment, from land and sea, to work towards creating a more sustainable future.



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Foreword

We are excited to have co-chaired the Steering Committee, working with the Organising Committee and using the process of co-design between Traditional Owners and the National Environmental Science Program (NESP) Earth Systems and Climate Change (ESCC) Hub partners. It has been a valuable journey since the National Indigenous Dialogue on Climate Change (NIDCC or the Dialogue) held on Yorta Yorta Country at Barmah in 2018.

We almost didn't make it to Cairns for the National First People's Gathering on Climate Change, due to the uncertainties of COVID-19 restrictions in the states and territories. However, over the past 2 years we had vision, a great team, and perseverance, and with some good fortune we made it to Cairns. Our original plan was to hold the Gathering on Country, as occurred with the Dialogue at Barmah, supported by the Traditional Owner participants in 2018. However, due to the pandemic, meeting on Country was not an option in 2021. We are very pleased, though, that Cairns' facilities, stunning weather, and access to on-Country activities helped successfully deliver the Gathering.

It was a robust, thought-provoking, challenging and rewarding journey to bring together 110 Traditional Owners from across the nation for the Gathering. We consider this an outstanding achievement by all involved that we managed to hold a very successful event.

The first evening of the Gathering was one of celebration of dance, song and beautiful stories of Country, all while getting to know each other. We were grateful to the host community, Gimuy Walubura Yidinji and Yirrganydji Traditional Owners, where the Gathering was held, for embracing 120 guests on their Country with a warm and celebratory welcome.

The first day set the scene and began with a very moving handing over of the message stick from Yorta Yorta to Gimuy Walubura Yidinji and Yirrganydji. Over the ensuing days, we gathered to discuss a rapidly changing climate in the Australian and global landscape, where Indigenous land managers welcome inclusion in the care and maintenance of Country from scientists of diverse disciplines, and government. We greatly enjoyed our field day travelling to three different locations with the Gimuy Walubura Yidinji and Yirrganydji Traditional Owners to learn about their land and sea management and climate change activities.

The participation of Traditional Owners and scientists at the Cairns Gathering provided the energy and commitment to make it a successful event through working and learning together. We co-designed sessions that ran across the 3 days of the workshop, covering extreme heat, extreme water events (both wet and dry), sea-level rise, tropical cyclones, marine heatwaves, and bushfires.

To close the Gathering, we again celebrated our time together with dance and song, enhanced the statement from 2018, and set recommendations. We were farewelled by our Traditional Owner hosts with a lovely message of safety for us all and that this was not 'goodbye' but 'until we meet again'.

This report from the Gathering provides a pathway of opportunities for Traditional Owners to understand, participate in, and lead, significant decisions and activities that relate to climate change impacts on land and sea Country.

Bianca McNeair and Damian Morgan-Bulled

co-Chairs, National First Peoples Gathering on Climate Change Steering Committee



2021 First Nation Peoples Statement on Climate Change

We, the participants attending the Gathering, acknowledge the voices of the Gimuy Walubarra Yidinji and Yirraganydji, whose lands we meet upon in 2021. Building on the 2018 statement from First Peoples on Yorta Yorta land, we as First Nation Peoples of Australia recognise that overwhelmingly scientific and traditional knowledge is demanding immediate action against the threats of climate change.

When Country is healthy, we are healthy. Our knowledge systems are interconnected with our environment and it relies on the health of Country. This knowledge is held by our Elders and passed on to the next generation. Solutions to climate change can be found in the landscapes and within our knowledge systems. Aboriginal and Torres Strait Islander peoples have the tools, knowledge, and practices to effectively contribute to the fight against climate change. We have lived sustainably in Australia for over 100,000 years.

First Nations people of Australia contribute the least to climate change, yet the impacts of climate change are affecting us most severely. We at the Gathering are calling for the following:

- A commitment from Federal Government to financially support an annual First Nations-led dialogue on climate change.
 - The annual dialogue should be a place where Aboriginal and Torres Strait Islanders can discuss the changing climate in their communities and is a valuable input to inform policy at all levels.
- A commitment for federal-level funding for an Indigenous-led climate action hub, which would fund both Indigenous-led mitigation and adaptation climate change projects. These projects could focus on:
 - Domestic emissions reductions through enabling reliable renewable energy supply to off grid communities, Indigenous-led nature-based solutions.
 - Indigenous-led adaptation planning for communities and the recording and transmission of knowledges and experiences across the country.
- The establishment of a Torres Strait Island taskforce, led by First Nations peoples of the region, to drive critical and tangible climate change solutions for island communities under present and immediate threat.

- We call on all Australians to join us in acting on climate change and in protecting the environment. To work collaboratively with us, learn our laws and our ways and respect our knowledges to find solutions together to combat climate change.
- Climate action that links all levels of government so our people and communities can work collaboratively in an Indigenous-led fight against climate change.
- The right to manage Country. First Nations peoples must be involved in the national dialogue about climate change and be engaged on any decision that impacts us and our Country. We call for these rights to be respected and observed on an international, national, state and local level. Our knowledge must be included in climate management frameworks.
- To look beyond ourselves, to include flora and fauna in climate planning and climate management frameworks so the plants and animals that support us can be represented.

We are seeing changes in the environment and the declining health of Country and people. We can see our native flora and fauna are suffering and the conditions of our lands, waters, seas and skies declining. For some of our people it is an emergency because the climate crisis has already caused widespread damage. Our connection to Country represents climate science developed over countless generations, listen to us, work with us and together we can enact a change that will shape our future for all Australians.

Executive Summary

Our purpose in hosting the National First Peoples Gathering on Climate Change (the Gathering) was to celebrate, learn from and enhance First Peoples-led climate action. We set out to strengthen kinships, cultural identity and well-being, and to strengthen caring for Country by using both Indigenous and scientific knowledge.

The Gathering supported this overall purpose through five aims:

- Bring Traditional Owners together to share with one another about climate change
- Share scientific information in a form useful for Traditional Owners
- Identify options for policy to respond to climate change
- Provide tangible information to take back to communities
- Highlight First Peoples' climate change actions.

110 Traditional Owners from across Australia attended the Gathering.

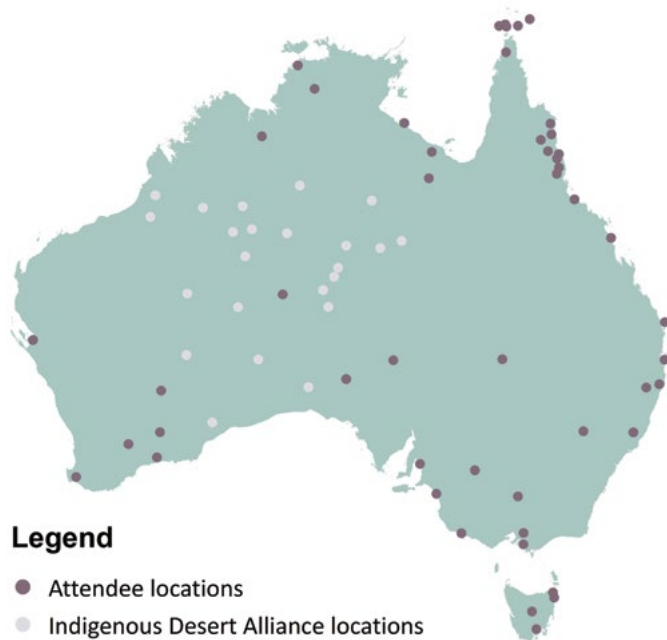
Traditional Owners sharing climate change knowledge with one another

Traditional Owners shared their experiences in understanding and responding to extreme events associated with climate change.

Gimuy Walubara Yidinji and Yirriganjdi Traditional Owners hosted a wonderful Welcome Ceremony. Field trips to the reef, rainforest and beaches allowed talking together with Country. Yarning circles were held back in town, bringing forward many common issues.

Extreme events and climate change are affecting First Peoples

The Gathering highlighted how extreme events are affecting First Peoples. First Peoples and scientists made joint presentations to start the later discussions on Country and in yarning circles.



Legend

- Attendee locations
- Indigenous Desert Alliance locations

First Peoples groups with delegates at the Gathering.

Marine heatwaves are causing loss of seagrass, kelp forests and mangroves. Coral reefs are bleaching. Culturally important animals are suffering e.g. dugong, turtle, fish, sea snake, crabs, conch-shells, prawns. First Peoples cultural activities, e.g. making kelp baskets and shell necklaces, are reduced, leading to a loss of health and wellbeing.

Bushfires are more intense, resulting in erosion, loss of wildlife e.g. flying foxes, and shifts from forest to savanna. Intense fires in the wrong place at the wrong time put a heavy emotional and mental toll on First Peoples. Cultural sites are damaged in the big fires. Aboriginal Rangers are playing a vital role in controlling bushfires and bringing back cultural burning.

Heatwaves are very intense on the lands of central Australia, which is warming faster than other parts of the continent. Mulga is dying, waterholes are drying up, and people are finding lots of dead kangaroos. Reading Country is becoming harder. Heatwaves affect Elders. Rangers need to spend more time on Country to watch, look and listen to the changes and become part of the climate change conversation.



‘The island that sits in the middle of Trinity Inlet [near Cairns] has a cassowary story. The cassowary lies there today ... In 2030-40 that island will be underwater. So this system will be gone in a sense. It will always be remembered. When we do that story about the cassowary and that dance we won’t be able to connect it to this country. We will, but it will be underwater ... We can’t let our totem species go, gindarji (cassowary), emu, freshwater turtle (bungaru) or saltwater turtle (njiwiju). We need them - they don’t need us’

– Gudjugudju Fourmile, Gimuy Walubara Yidinji Traditional Owner

Sea level rise is causing flooding of fish traps, middens, burial sites and erosion of these and other culturally significant sites. In the Torres Strait, islands are going underwater. Erosion affects food and fuel delivery and people may become climate refugees. Sharks, rays, fish, eels, insects and the monsoon are out of step with their seasonal patterns.

Cyclones are increasing in their intensity. Negative impacts of cyclones include habitat loss, risks to animal safety and life, risks to people and infrastructure, and land and sea management difficulties. Positive impacts

include halting the economic threats to Country, an immediate reduction in carbon pollution, cooling the reef, and a short-term boost to economy from recovery efforts. Cyclones can clean up Country but they seem to be getting more vicious.

First Peoples and the scientists found discussions of cascading impacts a useful way to bring their knowledge together. Climate change has created a series of cascading environmental impacts affecting resident plant and animal species, and in turn, Traditional Owners through their deep connection to Country.

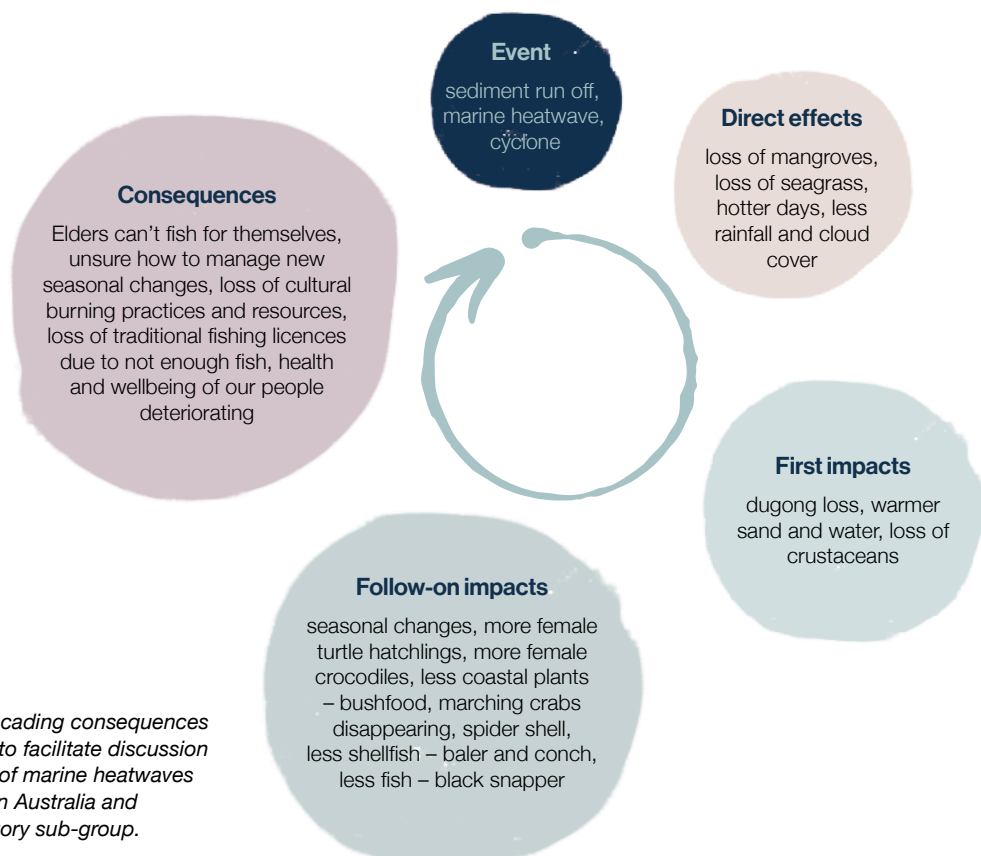


Figure 16: Cascading consequences diagram used to facilitate discussion on the effects of marine heatwaves for the Western Australia and Northern Territory sub-group.

Policy

The Gathering prepared a First Peoples Statement on Climate Change to guide future policy directions.

Connecting across the globe was greatly enjoyed by participants

James Rattling Leaf, a Lakota leader from South Dakota in the USA, shared information about the Group on Earth Observations Indigenous Alliance, which he co-founded. The Alliance links Indigenous groups to strengthen cultural heritage with global observation science, technology and Indigenous data sovereignty.

*Taha Cowen, a Melukerdee woman from southeast Tasmania shared information efforts on global climate change commitments through the **Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC)**, including how Indigenous people from all over the world are engaging on international climate change processes through the Local Communities and Indigenous Peoples Platform.*

*Birrin Hooper, a Bundjalung man shared information about the **Convention on Biological Diversity**. A new post-2020 Global Biodiversity Framework will be out late in 2021. First Peoples are at the forefront of biodiversity management – 3% of the world's population are protecting 80% of its biodiversity. In Australia, Indigenous Rangers and Indigenous Protected Areas are leading the way.*

First Peoples-led Co-design

The Gathering was developed through a First Peoples-led process of co-design. A Steering Committee of First Peoples, whose members received authorisation as a delegate from their respective First Peoples groups, made all informed decisions, supported by an Organising Committee from the ESCC Hub. The Steering Committee developed Co-design Principles to guide all the work of the Gathering.

The Steering Committee acknowledged the value of traditional knowledge and its ownership and produced a consent form for First Peoples to protect their Indigenous Cultural and Intellectual Property, and a Code of Conduct for scientists based on the Co-design Principles.

The challenging circumstances from COVID-19 meant that initial plans to hold the Gathering on Country proved impossible. Hosting in Cairns by Gimuy Walubara Yidinji and Yirrganydji with inspirational field days on Country proved a good compromise. The Gathering between Traditional Owners has proven its benefits in terms of peer-to-peer learning. The actions to bring science to Traditional Owners in ways that are useful, and achieve wider recognition of First Peoples roles and better policy, are still very much works-in-progress.

Both First Peoples and scientists committed to continue the dialogue and working together.



‘Coming together as one voice and people. We are stronger together and our connection to Country is needed more now than ever in our lifetimes. With our little footprints we can provide a big future for next generations.

– Bianca McNair, Malgana Traditional Owner, Co-Chair of the Steering Committee for the Gathering.

The big message that we have heard is that we need to focus on solutions. We need to start the journey together that can be passed on from community to community and help to transfer knowledge in any way we can. We need to continue the engagement.’

– Simon Marsland, National Environmental Science Program (NESP) Climate Systems Hub leader, CSIRO

Abbreviations

ABC	Australian Broadcasting Corporation
ACORN-SAT	Australian Climate Observations Reference Network – Surface Air Temperature
ACT	Australian Capital Territory
AIATSIS	Australian Institute of Aboriginal and Torres Strait Islander Studies
AMOS	Australian Meteorological and Oceanographic Society
BAC	Butchulla Aboriginal Corporation
COP	Conference of Parties
COVID-19	Coronavirus Disease of 2019
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DAPL	Dakota Access Pipeline
EPBC	Act Environment Protection and Biodiversity Conservation Act
ESCC	Earth Systems and Climate Change Hub
GBF	Global Biodiversity Framework
GBR	Great Barrier Reef
GEO	Group on Earth Observations
ICIP	Indigenous Cultural and Intellectual Property
IP	Intellectual Property
IPCC	Intergovernmental Panel on Climate Change
NAILSMA	North Australian Indigenous Land and Sea Management Alliance
NESP	National Environmental Science Program
NFPGCC	National First Peoples Gathering on Climate Change
NHMRC	National Health and Medical Research Council
NIDCC	National Indigenous Dialogue on Climate Change
NSW	New South Wales
NT	Northern Territory
PBC	Prescribed Body Corporate
QLD	Queensland
SA	South Australia
SC	Steering Committee
TAS	Tasmania
TC	Tropical cyclone
Treeforce	Trees for the Cairns Environment
TSRA	Torres Strait Regional Authority
UN	United Nations
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples
UNFCCC	United Nations Framework Convention on Climate Change
VIC	Victoria
WA	Western Australia

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1.0 Introduction

1.1 Purpose and agenda of the Gathering

The goal of the Gathering was to celebrate, learn from and enhance First Peoples-led climate change action. Activities at the Gathering had five aims:

- Opportunities for Traditional Owners to discuss and share with each other about how climate change is affecting Country and high impact weather events, including cultural activities
- Bringing scientific information – about how climate change is affecting Country and high impact weather events – in a suitable format that is visual and useful to Traditional Owners
- Identifying options for policy responding to these drivers of climate change and the drivers of climate impacts on extreme weather events, based on common understanding of the evidence from Traditional Owners and scientists
- Producing tangible information that could be taken back to communities to explain climate change, reduce hazards and explain how individuals can contribute to solutions
- Highlighting First Peoples' local and national roles and initiatives.

These activities were designed to deliver three important outcomes:

1. Strengthened kinships, cultural identity and wellbeing
2. Strengthened caring for Country utilising both Indigenous and scientific knowledge systems
3. National recognition and support for First Peoples cultures, and land and sea initiatives, including of the host community.

The Gathering set out to deliver these activities and outcomes through a five-day program of activities in Cairns from 22-26 March 2021 (Appendix A).

1.2 Indigenous-led co-design approach

The Gathering was developed through an Indigenous-led process of co-design. This is core to successful engagement with First Peoples, especially when inviting participation in a national agenda. The 2018 National Indigenous Dialogue on Climate Change (the Dialogue) provided an opportunity to put co-design in action. It demonstrated that co-design enables greater access, participation and empowerment of First Peoples in the development and implementation of climate adaptation and mitigation responses. The 2018 Dialogue also showed an overwhelming interest by First Peoples to better understand the frequency of abnormal changes in seasonal weather patterns, impacting on Country and people.

A key focus, therefore, of the 2021 Gathering was to uphold the co-design approach. In June 2019, the Australian Meteorological and Oceanographic Society (AMOS) Conference in Darwin hosted an Indigenous Symposium. Contributors at this event resolved to assist the Earth Systems and Climate Change Hub host another dialogue. A Steering Committee of First Peoples was formed, with all members receiving authorisation as a delegate from their respective First Peoples groups. An organising committee from the ESCC Hub supported the Steering Committee.

Early work by the Steering Committee focused on finalising a Terms of Reference, and a vision for the next dialogue as a First Peoples Gathering. Contributors to a further Indigenous Symposium held during the AMOS Conference in Fremantle in 2020 developed a set of Co-design principles for climate scientists in working with First Peoples². The Steering Committee adapted these principles, and added some material from CSIRO's Co-development Principles³, to arrive at their own Co-design Principles (Appendix B).

1 Morgan, M., Morgan-Bulled, D., Hopkins M., Hill R., Talbot L., Lyons P., . . . Wilson B. (2019). Workshop Report: National Indigenous Dialogue on Climate Change. Earth Systems and Climate Change Hub Report No. 11. Retrieved from Australia. Online: <http://nеспclimate.com.au/wp-content/uploads/2019/05/191209-NICCD-report-final.pdf>

The Co-design Principles recognise that there are fundamental barriers between First Peoples and western scientists that prevent them from accessing information that is relevant to them and their communities. Although well-intentioned, researchers in the past have not always recognised the importance of consulting First Peoples when working on Country, collaborating to deliver mutual benefits and acknowledging the value of traditional knowledge and its ownership.

The Steering Committee co-developed consent processes to meet the required ethical standards for the Gathering. They decided to include both a consent form that ensured protection of Indigenous Cultural and Intellectual Property, and a Code of Conduct for scientists based on the Co-design Principles. Underpinning the Code of Conduct was the idea that efforts should be made to ensure that the journey forward was as important as the learnings of the past. It is vital that relationships between and across First Nations Peoples with western institutions and systems are respected. Western institutions and people can listen to the voice of Australia's First Nations people, through a dialogue of mutuality.

The Steering Committee faced challenging circumstances from COVID-19 during 2020. Initial plans to hold the Gathering on Country proved impossible, and options for a virtual Gathering were developed in case travel proved totally impossible. The Steering Committee considered a number of places where local Traditional Owners had expressed interest in hosting the Gathering. They evaluated the options in relation to criteria including the ease of access from other parts of Australia, and the ability to hold a field day on Country. Cairns was selected as the best location considering all the constraints and opportunities. A Host Community Working Group was established with representatives from the

Gimuy Walubara Yidinji, Yirrganydji, and members of the Steering Committee and Organising Committee. This group developed the cultural program for the Gathering.

The Gathering was underpinned by the following ethical standards:

- United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP)
- AIATSIS Code of Ethics for Aboriginal and Torres Strait Islander Research
- National Health and Medical Research Council (NHMRC) – Ethical conduct in research with Aboriginal and Torres Strait Islander Peoples and communities: Guidelines for researchers and stakeholders
- CSIRO Indigenous Science Program.

The Gimuy Walubara Yidinji and Yirrganydji Traditional Owners began the Gathering with a moving Welcome to Country event on the evening of Monday 22 March.



Figure 1 Crocodile dance at the Welcome Ceremony by Gura Buna Gunggahji Dancers from Yarrabah Aboriginal Community. Standing - Jidka Colin Neal, crocodile - Dennis Koowoortha Harris, fisherman at front - Mortimer Mynga.

2 Pearce, K., Bullio, R., Morgan-Bulled, D., McNeair, B., Flugge, K., Mosby, H., . . . Hopkins, M. (2020). Considerations for co-design. Collaborating with First Nations peoples on climate change. *Bulleting of the Australian Meteorological & Oceanographic Society*, 33(3), 18.19.

3 CSIRO Indigenous Science Program with Independent Indigenous Reference Group and CSIRO Reference Group. (2019). Co-development Principles. CSIRO internal report.



1.3 Message stick hand-over

Jiritju Fourmile from the Gimuy Walubara Yidinji welcomed everyone to Country at the beginning of the session:

“

‘I welcome you here on behalf of my father and behalf of my grandfather and my great great grandfather. I’m one of your co-facilitators here. We hope you have a wonderful morning and have a good proceeding.’

– Jiritju Fourmile, Gimuy Walubara Yidinji Traditional Owner

Gavin Singleton from the Yirrganydji also welcomed everyone:

“

‘Firstly, I want to acknowledge our Elders past and present. I want to acknowledge our Elders, our Country where we get everything from, our identity. I want to acknowledge our next generation coming through. I want to acknowledge our leaders, our women, our men and our leaders of the past. I want to acknowledge our neighbours and our knowledge as, Traditional Owners of the rainforest and to the Great Barrier Reef. On behalf of our people I want to say... We all in good spirits and our ancestors are happy and proud and we wish you safe travels and safe time here and safe travels when you return. This doesn’t happen often, when we can have a talk about climate change, about all that is happening and the serious threat that is ahead of us.’

– Gavin Singleton, Yirrganydji Traditional Owner

The message stick handover discussions began with Des Morgan, from the Yorta Yorta, highlighting the significance of the occasion. Yorta Yorta are from the Goulburn-Murray valley, crossing the border from north Victoria to southern New South Wales. If you draw a straight line from Melbourne north to the Murray River, Yorta Yorta sit in there.


Des thanked the Gimuy Walubara Yidinji and Yirrganydji peoples for their warm welcome to Country. He thanked the Steering Committee for their work, for carrying this forum for the last couple of years particularly through COVID-19 and keeping the interest up from the group. It’s a pretty close-knit group here with a lot of work to do and with a lot of things in common. Yorta Yorta have had two gatherings on our Country with other Traditional Owners from across the nation on climate change.

Yorta Yorta were very honoured to have the last Dialogue on their Country and value the contributions made to stem climate change and to help all of us acclimatise and live with it and manage it. Des lives on his Country, hunts, gathers and uses his Country in the way the creator intended it to be, with the laws that were handed down by the creator and the methods shown by the Elders, the ancestors passed down through the years. Des commented that it is good to see a lot of scientists around who are willing to listen to stem the effects of climate change:

“

‘I walk on my country and I see the rivers dry up. Where I use to fish it is now blocked up with mud or sand. I walk out on my Country I don’t see no emus, kangaroos or porcupine and know something is wrong. The effects of nature affect me and my people ... where we use to fish, the fish are no longer there. The black water comes down our rivers, the fish are floating. The blue green algae is coming into our environment and destroying the nature. The people in the logging industry, are using our forests as plantation. There are no understory plants for our women to use to make baskets or animals for food.’

– Des Morgan Yorta Yorta Traditional Owner



All these things are part of climate change, connected to the way people are using the environment, the traditional environment of Yorta Yorta and other First Peoples.

Des thanked and acknowledged Damian for his role as Co-chair of the Steering Committee. Des handed over to Sonia to present the message sticks on behalf of the Yorta Yorta people. Sonia made these message sticks and their emblems.

Sonia began by thanking the Gimuy Walubara Yidinji and Yirrganydji nations and paid respects to their people, their Country, their Elders and thanked them for the warm traditional Welcome to Country:

'The way you speak of your Country is truly inspirational and infectious. You are a people we can learn from and we are. Thank you for visiting Yorta Yorta Country in 2018 to stand strong together and move forward together. We thank you for the warm Welcome to Country the song and open arms last night. It is an embrace that we will draw strength from when we return to our Country.'

– Sonia Cooper, Yorta Yorta Traditional Owner

Sonia explained that Yorta Yorta have two message sticks to give. The message sticks are made from red-gum.

The first one is a turtle, their totem, the long-neck turtle (*Chelodina longicollis*). Sonia is the Living Murray Facilitator and looks after 26,000 hectares of Country. They recently did a project, tracking eight turtles with data loggers and transmitters. The turtle it is a totemic species, a sacred species. On the back of the message stick is a map. There are camping spots, the Murray River is essential for the turtle. There is a massacre site on both message sticks. The turtle is for Gavin.

The second message stick is an emu, etched with its feathers and scars representing Country. The emu lives away from closed Country (forest) and is visible mostly when it rains, when the raincloud comes:

'The emu is for Uncle Gudjugudju. It represents the emu migration. It is a special species to Yorta Yorta Country. On the back is the same map that has the massacre sites. In Western Australia, in a place called Campion, there is a story of the great emu war. Back in 1932 the wheat farmers in WA said there were 20,000 emus on the hill. The farmers saw them as an invasion. They declared war on the great emu and slaughtered them. They asked for help from the military, couldn't get it, so they called in paid

shooters. They killed 986 emus with 20,000 rounds of ammunition before they gave up. The emus were just migrating across the country, just getting to water, they were just doing their thing. So there is a lot of pain with both the emu and the turtle.'

– Sonia Cooper, Yorta Yorta Traditional Owner

Gudjugudju thanked Yorta Yorta for coming and sharing stories about Country. He explained their totem is the cassowary, gindarjil in Gimuy Walubara Yidinji, bundarra in Yirrganydji, kunday in Tableland Yidinji. The cassowary are like a brother to the emu. The island that sits in the middle of Trinity Inlet has a cassowary story, the cassowary lies there today. That story is about the Mulgrave River that used to run through Trinity Inlet 10,000 years ago:

'Climate change impacts on a lot of our totemic species, we need to protect them. They are resilient, blackfellas on Country are resilient, they tried to get rid of us and the emu, but we still here. Jaba, your foot, stands on Country, that spirit that belongs to us, still stands on Country .. the effects of climate change impact on a lot of our totemic species. We are the custodians, and the protectors of those species. We are given that from our old people. We are given that from the spirit of the land we walk on, the spirits of the old people with you. Every time one species dies, we can't sing that song no more, and it's all about singing song for Country ... We can't let our totem species go, gindarji (cassowary), emu, freshwater turtle (bungaru) or saltwater turtle (njiwiju). We need them - they don't need us.'

– Gudjugudju, Gimuy Walubara Yidinji Traditional Owner

Gudjugudju welcomed the talking this week about how First Peoples are impacted by a human-induced climate change, which is not the same as the natural one that happened 10 or 20 thousand years ago. He looked to the Gathering coming out with answers, the answers we need to happen, and thanked everyone for coming.



Climate change impacts on a lot of our totemic species, we need to protect them.

– Gudjugudju, Gimuy Walubara Yidinji Traditional Owner

Larissa Baldwin read out the Statement from the 2018 Dialogue, hosted by Yorta Yorta on their Country.

STATEMENT (2018)

We call on the Australian Government to participate in **Theayimbinukka** with us. To stop, look and listen.

STOP DESTROYING AND DESECRATING OUR COUNTRY.

Look to the future and where the terrible path we are on leads us to. Listen to our knowledge and culture or face cataclysmic consequences.

This all means the immediate cessation of the legislative and contractual genocide they have been committing for centuries, and to observe and respect the sovereignty of First People's culture. In this, we call on the Australian Government to **formally and permanently subscribe to articles 31 - 39 of the United Nations Declaration of the Rights of Indigenous Peoples**, and to treat us with dignity and respect that these principals outline.

We also call on the Australian Government to resource us adequately, so that we can continue to observe and teach the cultural processes that are going to help meet this enormous challenge.

We are humble before our ancestors and elders, and ask that the Australian Government humble themselves as well.

IT IS ONLY UNITED THAT WE CAN MEET THIS THREAT, AND ONLY DIVIDED THAT WE WILL ALL FALL.



Credit Rhys Paddick

1.4 Facilitators introductions

The facilitators for the Gathering, Tishiko King and Millie Telford from Seed and Jiritju Fourmile from the Gimuy Walabara Yidinji introduced themselves.

Jiritju Fourmile attended the 2018 Dialogue held on Yorta Yorta Country. Jiritju greatly enjoyed walking on Yorta Yorta Country, seeing their sites, taking a boat ride on the Murray River, seeing wildlife and talking of the issues they were facing. He found common issues around water shortages and their effects on fish, turtles and eels. Jiritju acknowledged that the animals are important to the land — they feed us knowledge, they feed us physically and spiritually as well. He was fortunate to learn his culture, dances, his people, past and present, learn about his Elders, and now pass it on to his daughters. Jiritju explained his responsibility to talk about these issues, the climate crisis, hand-in-hand with others, to listen to the Elders, and pass it down to the younger people.

The younger people need to recognise we take on that fight and lead that fight.

Tish King introduced herself as a proud Torres Strait Island woman with strong connection to Masig and Budu islands. She is a community organiser at Seed Indigenous Youth Climate Network. Seed have been building the capacity of young Aboriginal and Torres Strait Island people to come together and collectively take action. Seed believes in and want to see a just and sustainable future for all. The First Nation justice will be climate justice. Seed is Australia's first and only Indigenous-led climate organisation and is becoming independent with its own entity. Some of those people who did the hard work to establish Seed were present in the room. Tish studied ocean science at university and is super passionate about protecting the environment and learning and sustaining culture. Millie Telford also introduced herself as a community organiser with Seed.

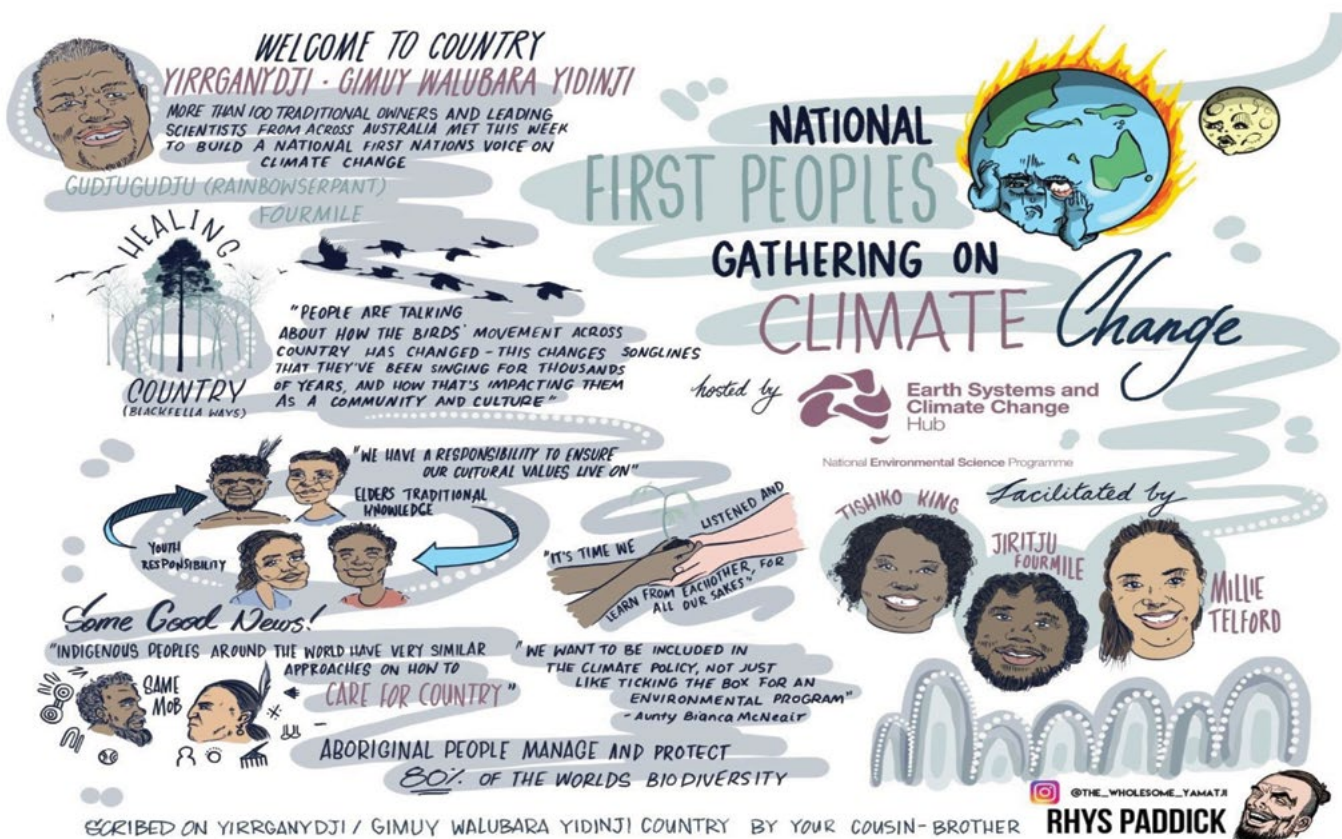
Several participants introduced themselves and made comments.

'I'm Dan from northeast Tasmania. Climate change is having an impact on our cultural practices specially our women's knowledge. Our women use the shell, strong necklace they make, the shells grow so far out in the ocean now the women can't get to them. These cultural practices create an economy, they are losing it, it's so important we acknowledge impact of climate change. We've seen the bushfires last year, Tasmania is a ticking time bomb. [when we go for a] walk into the bush, it's dense, thick. We run traditional fire workshops, we approach land holders. We talk about climate change, the impact. We talk about the time of year to put fire into the bush. The two biggest organisations in charge of fire in Tasmania, they burn big large fires, completely wipe out our ecosystems. It hurts, it is painful to see your Country go up in flames, see your Country suffer. Whitefalls need to learn, we have the knowledge, the history proves it. They need to jump on board with us and let us do it. Thanks to the Traditional Owners for letting us be on their Country. It's an honour.'

'I'm Harold Ludwick from Gugu Yimithir. I'm here because of the impacts on food webs in our Country ... I've seen the quolls, the black skink with a white stripe down its back, missing now, gone from the sixties. The migration of the Pied Imperial Pigeon, always coincided with the weather, our people could hunt them. Now it's not coinciding, our people would have starved, if it had happened back then.'

'I'm Simon Marsland from CSIRO. I was also at the Yorta Yorta meeting, it stayed in my heart. I'm a modeller, I do everything on computers usually. Talking to people is nice. Our Hub has put a lot into this meeting, and also a lot of support into the Yorta Yorta meeting. I'm leading a new hub on Climate Systems Science, which will continue the work. We've started something because of these communities, we hope we can continue, we are not going away, I hope we can achieve a lot together.'

'I'm Kathy McInnes also from CSIRO, I'm honoured to be here this week, first time to participate in a gathering, in awe of the knowledge you have of this beautiful country we live in, happy to be here to learn. We hear of the crisis we are in, the wildlife is stretched. Like Simon I stare at computer screens, look at projections, but we need to turn those models into knowledge about how to protect all the things in our beautiful country. Thank you.'



1.5 Traditional Owners sharing climate change knowledge and experiences

Bianca McNeair, from Malgana Gutharraguda (Shark Bay), led the session on exploring Traditional Owner knowledge about climate change through a timeline activity. She explained that she uses this activity in schools to show young people why Aboriginal knowledge is important, and to teach about climate change and managing Country. The timeline activity could be taken back to other communities to begin these conversations.

Bianca then invited other participants onto the stage to hold up a rope, which she explained represented a timeline from 60,000 years ago to the present. The timeline shows Aboriginal history, based on archaeological and historical events. She then began placing significant events, printed onto cards, onto the string timeline. She explained that others doing this activity could add what they know from their Country to the timeline when doing it themselves.



Figure 2: Bianca McNeair explains the activity of placing significant Aboriginal events onto a rope timeline representing the past 60,000 years.

Timeline

The events on the timeline were:

Evidence of grinding stones at Barrow Island (Karratha) in WA, showing that Australian First Peoples were the first bread makers. Our education system still teaches that the Egyptians made bread first, which is refuted by this evidence.

50,000
YEARS AGO

46-49,000
YEARS AGO

Evidence of bone needles
and wooden tools.

Cave painting in Maxwell
valley, Tasmania. Traditional
art has recorded our natural
knowledge about how to look
after Country.

33,000
YEARS AGO

29,000
YEARS AGO

Evidence of charcoal in
Tambour, Melbourne.

Stone artefacts
found near a cave
in Maxwell Valley,
Tasmania.

18,000
YEARS AGO

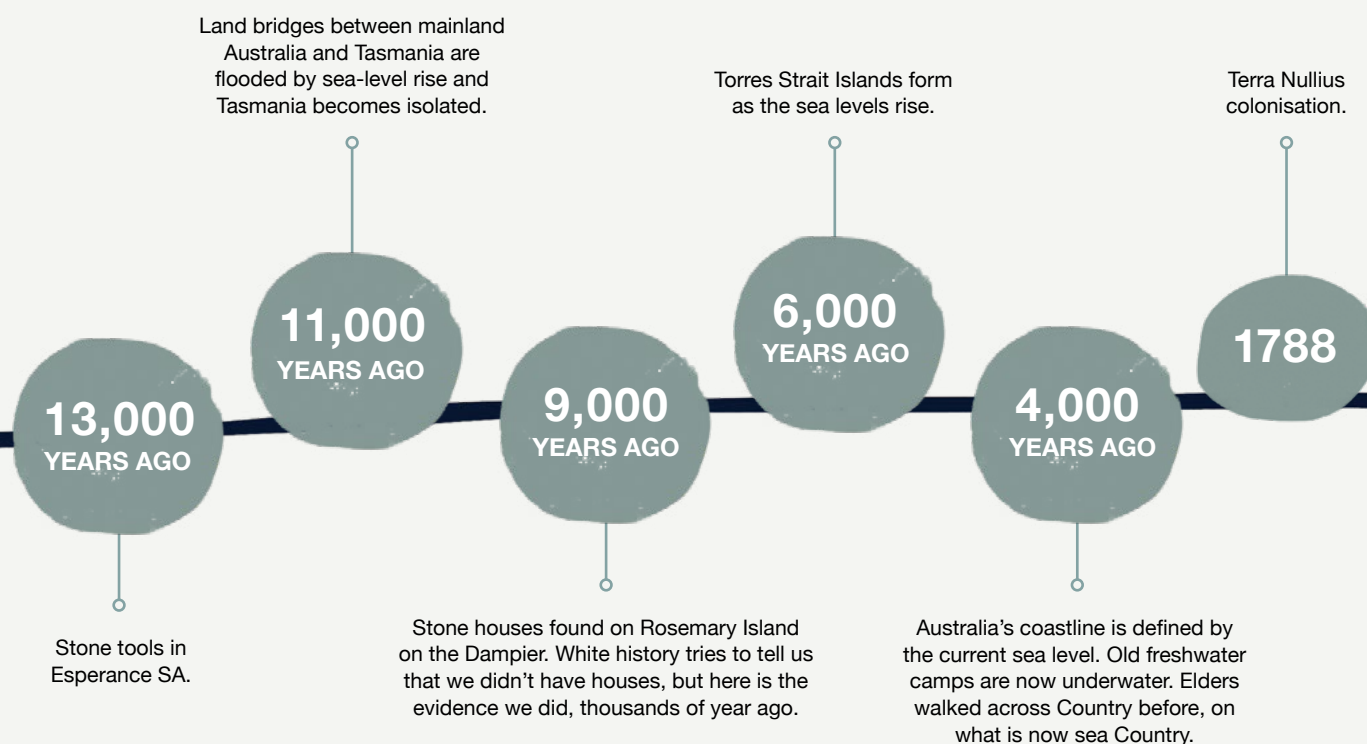
Buyungurra video

Bianca played a video, 'The Buyungurra who didn't listen' https://www.youtube.com/watch?v=OcZJ723u_98 (produced by First Languages Australia, ABC Indigenous). She explained that Gatharraguda (Shark Bay) is the home for the turtle, who is looking for food and somewhere to live. The video showed an animation of the story. The kangaroo character, Bigurda, gives advice to the turtle (Buyungurra) on eating berries. Buyungurra doesn't pay attention to the warning and eats as many berries as he can find. Yalabidi, the Emu, watches on and notices. He calls out to Buyungaurra and again warns him to stop eating the berries. The long line of berries eventually stretches into the sea. Buyungaurra doesn't listen and continues to fill his belly with berries. He doesn't stop, and even keeps searching for the biggest, juiciest berries. Bigurda and Yalabidi watch on and shake their heads. The dugong, Wuthuga, advises Buyungaurra that he is now stuck in the ocean as a result of eating the berries as far as the water. Buyungaurra's legs turn into flippers to help him to swim. However, even with his new flippers, he has to occasionally come up to the surface to breathe.



Figure 3: Showing 'The Buyungurra (turtle) who didn't listen' video.

This video aimed to serve as a reminder that Buyungarra originally came from the land, and from time to time needs to just listen. This video is based on a story that Bianca's mother used to tell her. Her daughter animated it, following cultural protocols.



Scientific introduction to climate change and sea-level rise

Kathy McInnes, a scientist from CSIRO, then presented information about sea-level rise and climate change. She shared that sea levels have changed over hundreds of thousands of years, depending on ice ages and interglacial periods. She showed a slide with these sea-level changes from 800,000 years ago to the present. She then showed how carbon dioxide (CO₂) levels and global temperatures track these changes in sea-level rise (i.e., when CO₂ goes up, we expect that sea levels will rise).



Figure 4: Kathy McInnes presenting scientific information on sea-level rise.

“

... it will take hundreds of years for the ocean to respond.

Kathy then showed how CO₂ levels have had a massive spike in recent years. Sea levels have been reasonably stable over the past 6,000 years, but now they are rising at an average of 3 cm per decade. The concerning thing about this rise is that ‘the ocean has a long memory’, meaning that this rise is being caused by historical emissions in the past 200 years. Even if emissions stopped today, the sea levels would continue to rise due to previous emissions. This slow response rate means that there is an urgent need to mitigate emissions now, because it will take hundreds of years for the ocean to respond. Sea-level rise may increase to as much as 10 cm per decade, which will have large impacts on humanity. This rate can only be slowed by reducing the amount of CO₂ entering the atmosphere.

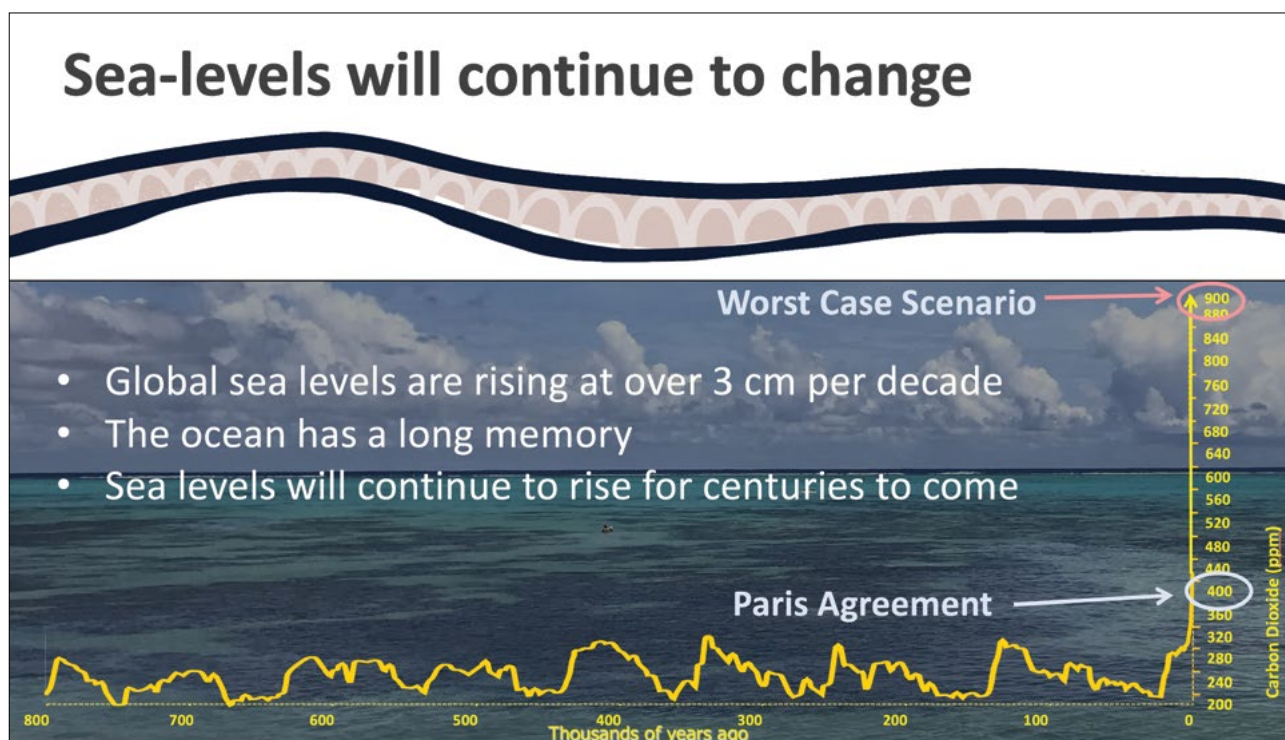


Figure 5: A slide from Kathy McInnes' presentation on sea-level rise, showing CO₂ levels.

1.6 Bringing ethics

The 'Bringing ethics and climate science' session was chaired by six Steering Committee members, who discussed the ideas behind the ethical process for the Gathering. The Steering Committee members included Bianca McNeair (Malgana Traditional Owner), Damian Morgan-Bulled (Yorta Yorta Traditional Owner), Djungan Paul Neal (Djungan Traditional Owner), Hilda Mosby (from Torres Strait Regional Authority), Samarla Deshong (Konjimal Traditional Owner) and Djarra Delaney (Quandamooka Traditional Owner). The session presented the draft co-designed consent process for Traditional Owner attendees, as well as a Code of Conduct for non-Traditional Owner scientist attendees. Bianca explained that the first and foremost goal of this process was to protect Indigenous Cultural and Intellectual Property (ICIP) and make it a culturally safe space in which to share and learn. The Steering Committee members shared why they felt the Gathering and the co-designed consent process were important.



Figure 6: Hilda Mosby talks about her experience on the Steering Committee. From right: Damian Morgan-Bulled, Hilda Mosby, Samarla Deshong, Bianca McNeair.

Djarra talked through the co-designed consent process, saying that they used the consent forms developed at the 2018 Dialogues as a basis, and then worked with the ESCC Hub on improving it. He said that the Steering Committee changed the document to a more co-designed format. He explained that the document acknowledges moral and cultural rights and adds another layer of protection in the form of ICIP protections. This ensures that Traditional Owner knowledge is not used in a way that has not been approved. Also, there was a separate Code of Conduct for scientists, to make sure that it was a respectful process, conducted on an equal footing.

The consent forms were handed out to all attendees to read, and questions were invited.

Questions and comments from the audience

Oral McGuire (Ballardong Noongar Traditional Owner) asked the panel about the best thing to come out of the co-design work with CSIRO, and the biggest threat going forward. Bianca responded that going through the conversations about co-design was not always easy. They stuck with it to ensure that there was a Code of Conduct for scientists that outlined communication processes, speaking to Elders and permissions for sharing. She said that the biggest challenge will be making sure that we stick to this process and don't get diverted by different agendas. Samarla shared that there is starting to be much more collaboration with researchers, but the biggest issue was making sure that researchers don't just 'come in, yarn and leave'. Hilda shared her experiences working with researchers and said that cultural practice is paramount in such cases, making sure that anyone who comes in needs to work with the communities and understand where they are coming from. Djarra then said that co-design processes are rarely put into practice properly, so it has been good to see it put into practice as it has been, with the opportunity to learn and improve. Damian shared that the biggest challenge he foresees is continuing to advocate for climate change action and putting into place the right mitigation projects. Paul said the best thing about the co-design process was the opportunity to express ourselves as one people.

'We manage through one law, and that is respect... As humans we have responsibilities, as we are the custodians and have never left. We need to pick up on what this country actually means. We want to help slow down and stop what's happening.'

– Djungan Paul Neal, Djungan Traditional Owner



Figure 7: Djungan Paul Neal talks about the co-design process. From right: Djungan Paul Neal, Damian Morgan-Bulled, Hilda Mosby, Samarla Deshong, Bianca McNeair, Djarra Delaney.

Gavin Singleton (Yirrganydji Traditional Owner, and Host Community Working Group member) shared that he has had Elders say to him that they don't see climate change as a threat because it's natural to have change. He explained that he knows that the spirit of land and sea are not happy. Although it is hard to separate human impacts from natural weather variations, looking at the ecosystem and the food web shows that people are part of the system. He said that Traditional Owners have been talking about these issues with one message, which integrates Traditional Owner knowledge and perspectives on how to tackle climate change. He finished by saying that it is vital that knowledge isn't used against them, as it is being shared in order to help Country and the planet.

Ro Hill, CSIRO scientist and Organising Committee member, thanked the Steering Committee for showing co-design leadership. She explained that the purpose of signing the consent form was to protect Indigenous Cultural and Intellectual Property (ICIP), because there is a long and sad history of scientists doing the wrong thing. The Committee came forward with principles for co-design, which were then used in the consent form and Code of Conduct for scientists.



Figure 8: Gavin Singleton makes a comment in the ethics session.

Peter Murray, Chair of the 10 Deserts project, asked the panel to comment more on the ICIP agreement between researchers and universities. Djarra explained that the main goal is for these processes to involve a more reciprocal relationship. He commented that knowledge is often stitched together by researchers to suit a western academic journal. This Gathering highlights the need to consider ethics and Intellectual Property (IP). There is a lot of work to be done in institutions but through the co-design process we are getting closer to goals. Peter Murray shared his experiences about the need for flexibility in IP agreements, to take control of everything on Country. His work has full IP rights and the information is then owned by Traditional Owners.



‘The scientists come in and bring methodology but then they own this. We need flexibility in the agreement to make sure we own this... It’s a long road and Traditional Owners need to stand strong in making agreement tractable for themselves.’

– Peter Murray, 10 Deserts Project

An audience member brought up her experiences working between the areas of science and traditional knowledge during her studies. She shared a story about researchers not talking to the right people before conducting research to find out how they feel about the research. When talking about ethics, there is a responsibility for land managers and landholders and ‘right people on right Country’ to speak the truth. She said that talking through how we want our stories told is a vital step.

The session ended with attendees being asked to read the documents carefully and if comfortable to sign and return them.



Figure 9: Bianca McNeair talks about the challenges of the co-design process.

1.7 Understanding global warming

Djarra Delaney, a Quandamooka man from Minjerribah (North Stradbroke Island) and a member of the Steering Committee for the NFPGCC, gave a presentation that introduced important scientific concepts relating to climate change.

He started the presentation by discussing the difference between climate and weather, stating that weather changes from day to day, while climate is a pattern of change over a long time. Climate changes slowly, but ultimately influences the weather we experience day-to-day. He gave an example of this concept from Minjerribah and Mulgumpin (Moreton Island), and the channel between them. He explained this channel changes over time, and how it is predicted that over time climate change will flood and generally destabilise this area. He spoke about the damage to houses that is already happening (while saying that permanent settlements are not the Traditional Owner way on Minjerribah).

Djarra then spoke about the different influences on climate, namely changes to Earth's orbit, solar changes, volcanic eruptions, and changes to greenhouse gases. He showed a diagram explaining the greenhouse effect: certain gases in the atmosphere help trap heat, but due to increases in these gases it is now like 'having a doona on when it is no longer cold'. He showed graphs of the change in atmospheric CO₂ concentrations, and how temperature tracks these changes. The record shows that the recent increase in CO₂ is unprecedented in the past 800,000 years. First Peoples have therefore lived through ups and downs in climate extremes, including massive sea-level rise. These changes split Tasmania from the mainland and created the islands of Torres Strait. Before this, First Peoples traversed those land bridges. He then talked about how the shoreline of Moreton Bay had changed and reflected that many sacred sites might now be underwater. He showed observational data on CO₂ over time from Mauna Loa in Hawaii and Cape Grim in Tasmania.

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‘We have the knowledge and the history to be able to not only survive coming changes but to teach others how to better live within their environments.’

– Djarra Delaney, Minjerribah Traditional Owner

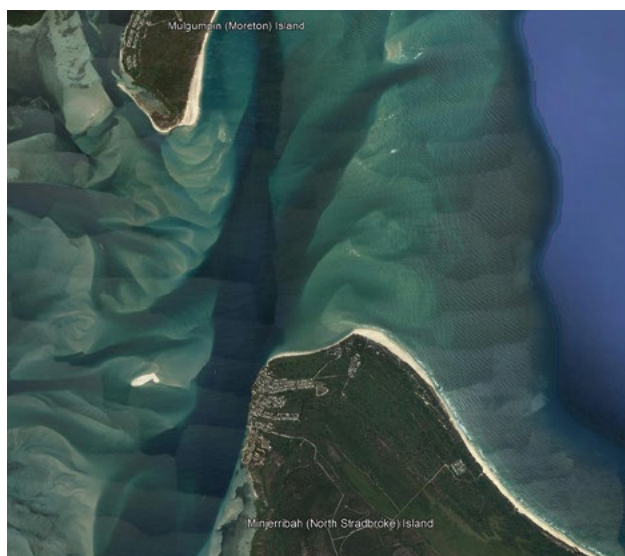


Figure 10: The channel between Minjerribah and Mulgumpin (North Stradbroke and Moreton Islands) which is changing over time.



Figure 11: The different processes that can cause changes to climate.

Djarra showed the breakdown of different greenhouse gases in terms of their global warming potential, and how methane and nitrous oxide have greater potential for warming than CO₂ but are emitted in smaller quantities. He discussed the different sources of greenhouse gases such as agriculture, mining, factory farming and transport. All these things are occurring on First Peoples Countries.

He ended the presentation by talking about what this means for Traditional Owners, including sea-level rise, changes to rainfall, heatwaves on land and sea, changes to the frequency and intensity of cyclones, changes to plant and animal systems, and changes to human systems.

“

‘Us as humans and our mob know that we are part of the animals affected. In a lot of ways mother nature doesn’t have a voice box to communicate, but it also does because it’s telling us in a direct way what’s happening... We need to listen to each other and to our environment.’

– Djarra Delaney, Minjerribah Traditional Owner

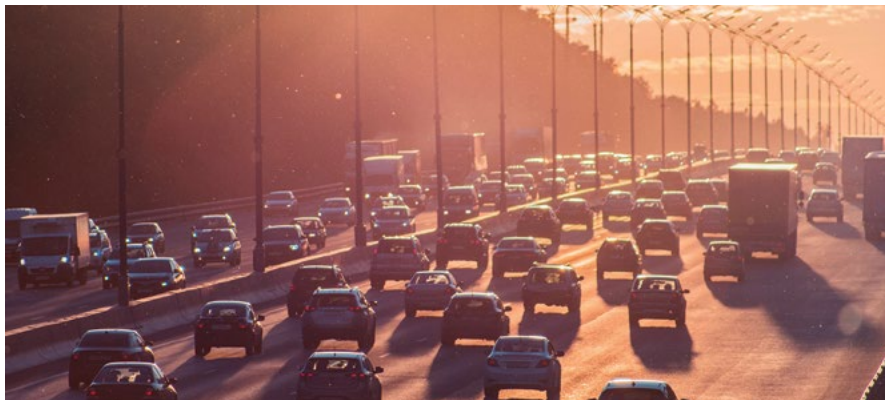


Figure 12: The different sources of greenhouse gases that cause changes to climate, including agriculture, mining, factory farming and transportation.

2.0 Marine heatwaves

2.1 Joint presentations about marine heatwaves

Bianca McNeair and Nykita McNeair, Traditional Owners, and Malgana Rangers spoke about cultural values, climate knowledge and experience in Gutharraguda (Shark Bay). Bianca described the Shark Bay area as two bays sticking out from the WA coast about halfway down. The area is a meeting point for northern and southern oceans, and many species found in Shark Bay sea Country are specifically adapted to that part of the coast. As the country is very different north and south of Shark Bay, Traditional Owners are isolated in how they manage Malgana Country and look after endangered species. Seagrass is a very important resource, sustaining the unique, biodiverse environment of Shark Bay. Working on seagrass is important to Malgana people. Bianca and Nykita also take part in a loggerhead turtle tagging and monitoring program on Dirk Hartog Island with the state environment department. For Malgana women, it is very important to be able to look after the turtle nesting. Nykita described how she was taught a lot of cultural knowledge by her grandmother and, being a ranger, continues to do her work in the area. Everyone in the community works together for the same goal. Two-way learning means that goals are easier to reach as a community, and the community works with scientists as well.

Malgana culture and Country is important to me because I grew up in Shark Bay – I was taught a lot of cultural knowledge by my grandmother and I still carry that with me today ... Two-way learning means it is easier to reach our goals as a community.

– Nykita McNeair, Malgana Traditional Owner

Neil Holbrook, a professor at the Institute for Marine and Antarctic Studies at the University of Tasmania in Hobart, spoke about the significant seagrass damage and loss in Shark Bay associated with the extreme marine heatwave in 2011. Seagrass beds occur in shallow marine waters where they provide food for dugongs, turtles and other grazers, nurseries for young fish, carbon storage and act as sediment stabilisers protecting the coastline.



Everything evolves around saltwater ... it [seagrass] is really important to us ... we hand down traditional fishing licences in our family and we hunt mainly mullet and whiting ... we grew up learning from our Elders about those fishing methods and learning about different resources and how we can use those to manage Country.

– Bianca McNeair, Malgana Traditional Owner

Seagrasses are vulnerable to changes in water quality and sea temperature. The seagrass in Shark Bay was healthy prior to 2011, when there was an extreme intensity marine heatwave. The language around marine heatwaves wasn't established at the time.

The water was up to 5°C warmer than normal, which is a huge amount in the ocean. The marine heatwave affected a significant area over considerable time and coincided with approximately 36% of the seagrass meadows in Shark Bay being damaged. At that time, there were also other effects: Ningaloo experienced coral bleaching, there were crustacean losses in southwest WA, fish were seen further south than usual, and kelp was devastated. Under a changing climate, marine heatwaves are becoming more frequent, more intense and longer-lasting. Thinking about 'cascading consequences' helps us to consider the impacts of an event from the beginning to all the subsequent effects.

Bianca described the effects of the 2011 marine heatwave and the restoration work underway. The disappearance of seagrass patches was the biggest change noticed straight away. Because of this, there were many fewer black snapper, which are special for the women and previously could be caught just offshore in the seagrass beds. There was murky water instead of the usual clear water, which was very different to what people were used to seeing. There are sharks in Shark Bay, but Malgana people can see through the water and they don't swim if there are sharks. Without seagrass, the water becomes murky meaning people don't want to get in the water. The seagrass loss affected many different layers of culture, so it was necessary to try to restore the losses. Malgana Rangers are working on a project looking at the genetics of the seagrasses and trying to restore seagrass beds using ones that can survive in a warmer climate.

Nykita spoke about the seagrass restoration project in Shark Bay that is helping to grow and stabilise the seagrass beds. Malgana Rangers have been working with the University of Western Australia and are using this as an opportunity to integrate learning, because the project needs the cultural knowledge of Traditional Owners and Elders. Over 200 degradable hessian bags were filled with sand and these were moulded, stapled and dropped into the damaged seagrass beds. Once in position, the team hooked previously germinated seagrass seedlings into the bags. It provided a stable and safe place for the seedlings to rejuvenate and repopulate the damaged areas. The survival rate of seagrass has been high, and there were higher populations of fish in the restored areas. Seagrass is important for Malgana People culturally because it is relied on by dugongs and turtles, which are important for food and culture. The rangers continue to monitor seagrass and work with the scientists on the data, which is important to keep in the area.

...there were a lot less black snapper. They are special for the women because we could go just offshore to the seagrass beds and catch those black snapper and we could get things for the old ladies. Now we can't get those fish because the seagrass is gone ... [we are] trying to work with the different genetics of those seagrasses, to try and create something that is more sustainable and can survive the warmer climate.

– Bianca McNeair, Malgana Traditional Owner



We're slowly getting to rejuvenate those seagrass beds and getting them back to the way that they should be.

– Nykita McNeair, Malgana Traditional Owner

There was further discussion about the genetic diversity of Shark Bay, the selection of varieties of seagrass that have survived a warmer climate and about how land management helps seagrass restoration. There is work on runoff from the Worramel River, managing riverbeds, and revegetating the riverbanks, coastlines and mangroves, which is all part of managing sea Country. Bringing Indigenous science and western science together was discussed, including the need to have conversations and participation together from the beginning and throughout all aspects of the project. The Malgana Ranger project is a work in progress and some big conversations have been needed; for example, around speaking for culture, leading the research, being involved in data entry and keeping connection between Country and research. The main aim is for the research to be led by the Malgana Rangers and they are training to do this.

We are trying to...create those opportunities on Country to do that scientific work and have a stake in every activity ... That knowledge and the ownership of the knowledge must stay with Traditional Owners.

For Aboriginal people, we've grown up with doom and gloom, but there is always a thought for our great, greatgrandchildren and what we might be able to leave for them; for me this project is all about us, as saltwater mob learning how to plant a tree in the ocean. For everyone on the land, [you have] that feeling that you have been able to plant a tree and knowing that you have left a legacy that will help the environment. That's the first one I know that is for saltwater people, to be able to teach our young kids how to plant seedlings and create their own forests under the ocean. So that's something we have to look forward to.

– Nykita McNeair, Malgana Traditional Owner

Marine heatwave temperature anomalies
04 Feb - 07 Apr 2011

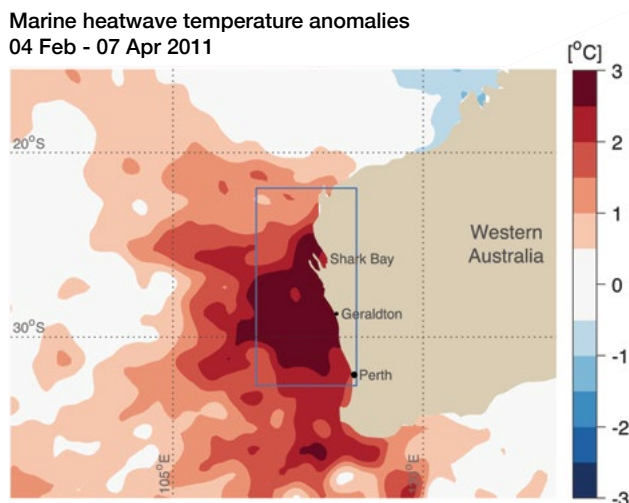


Figure 13 Mean sea surface temperature anomalies during the 63 days of the 2011 WA marine heatwave relative to the 1983-2012 seasonal climatology. The white dashed box indicates the extent of the area analysed.



Figure 14: Bianca McNeair filling sand-filled hessian bags in which new seagrass seedlings can grow. Image: Elizabeth Sinclair.

2.2 Yarning circles about marine heatwaves

This session started with attendees introducing themselves and their interest and connection to marine heatwaves. This was followed by a scientific presentation by Neil Holbrook on the potential consequences of marine heatwaves. The group discussed the observed impacts of marine heatwaves on their Country. Three clear regional groupings were identified in the discussion. The session then divided into a group working on issues facing Western Australia and the Northern Territory, a group working on issues in Tasmania, and a group focussing on the Torres Strait and Great Barrier Reef regions.



Figure 16: The marine heatwaves group presents their thinking. At front from right: Nykita McNeair, Shenade Muller, Taha Cowen, Nichola Milyari Fitzpatrick.

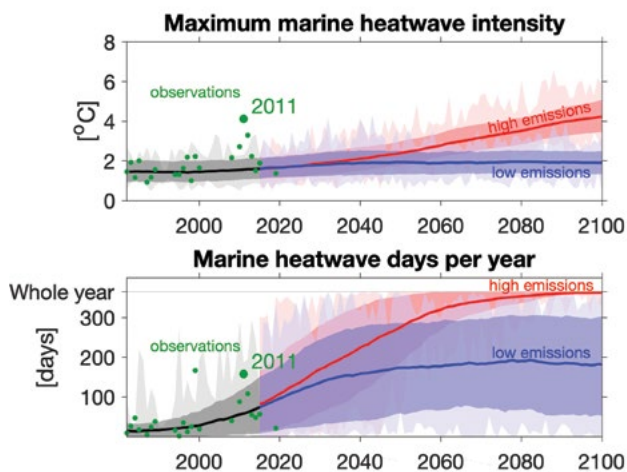


Figure 15: Projected marine heatwave intensity and days per year, under high and low greenhouse gas emission scenarios.

Selected reflections on personal experiences and interest in marine heatwaves

The group had very diverse direct and indirect experiences with the phenomenon of marine heatwaves across Australia. Nicholas Milyari FitzPatrick, a Yanyuwa and Garawa Traditional Owner, explained how as a ranger and a hunter, he had seen changes to coastal ecosystems in the Northern Territory, with knock-on impacts to important species such as dugong. Taha Cowen and Laura Butler, Melukerdee Traditional Owners, explained their concerns regarding the loss of giant kelp in Tasmania and impacts on important cultural species such as maireener (rainbow kelp shells), which lead to a loss of cultural connections. Torres Webb explained

that the Torres Strait Islands can act as centres of resilience to marine heatwaves and strongholds for species such as green turtle, due to the cool upwelling around the strait. The attendees from Shark Bay, Nyikita and Bianca McNeair (Malgana Country), reiterated their experiences with marine heatwaves as presented in the seagrass die-back session. Sharon Brady, from Western Yalanji emphasised that although they are savanna and freshwater people, there are important knock-on impacts, as what happens in freshwater Country can impact marine ecosystems. Gavin Singleton, a Yirrganydji Traditional Owner, spoke about the impact of marine heatwaves on corals in the Great Barrier Reef, as well as impacts on crocodile and turtle nesting success.

'We are concerned about marine heatwaves because they're killing our seagrass and making our waters unhealthy. Seeing changes over time is concerning... it's disheartening and scary for me, but if we put out heads together, we can get a positive outlook.'

– Nykita McNeair, Malgana Traditional Owner

Scientific introduction to marine heatwaves

Neil Holbrook from the University of Tasmania presented further scientific information on past marine heatwaves around Australia's coast, and projections of future marine heatwaves. He explained that marine heatwaves are unusually warm waters that approach the upper limits of what might be expected at a particular time. There have been a number of very intense and unprecedented marine heatwaves events, namely three events in the Tasman Sea (2015/16, 2017/18, 2018/2019), a devastating event in Western Australia in 2011, and broad event across Northern Australia in 2016.

The projection of future marine heatwaves depends on carbon emission trajectories over the coming decades. In a high-emission scenario, events such as the 2011 WA heatwave might become more commonplace later in the 21st century, such that this becomes the new normal.

Following this presentation, questions were asked about matching timelines of researchers to the timelines of Traditional Owners, who have stories going back to Pleistocene times. Sharon Brady shared a creation story emphasising how the sea and land are interlinked.



'The story in Kuku Kuku Yalanji was that kanka was the sea, but when it travels to the western sunset it becomes jila, the land. The salt needs to marry the land. And we have all experienced something on this scale. The marriage of land and sea, and wet and dry. They are brothers and that's the bloodline.'

– Sharon Brady, Western Yalanji Traditional Owner

Perceived impacts of marine heatwaves

The group then brainstormed impacts of marine heatwaves, based on their personal experiences, including:

- coral bleaching in the Great Barrier Reef, and therefore loss of coral diversity
- types of species and abundances are changing; for example, northwest blowies (pufferfish) are taking over in Shark Bay, and new warmer water species moving further south in Tasmania
- mangrove die-offs and the impacts on the animals and plants living there; for example, prawn die-off in the mangroves
- turtles breeding impacts
- loss of seagrass meadowsturtle breeding impacts: high temperatures causing too many females, and sand becoming too hot to nest
- behavioural patterns of dugongs and dolphins: looking for cooler water and so they travel to deeper areas, but the young can't survive there as they get attacked by sharks
- survival rates of animals are decreasing: sea snakes, dugongs, turtles, shellfish and conches
- change of dominant species of fish; for example, black snapper decreases and associated changes to fishing spots
- flow-on impacts on people (for example, giant kelp dying, so traditional cultural activities such as baskets are affected).

Three sub-group sessions on marine heat waves: WA & NT, Tasmania, Torres Strait & GBR

The three sub-groups were: Western Australia (WA) and the Northern Territory (NT), Tasmania, and Torres Strait and Great Barrier Reef (GBR) regions. The discussions used a cascading consequences diagram. The impact of marine heatwaves was broken down into direct effects, the first impacts of those effects, follow-on impacts and final consequences. The groups then identified important next steps for each region. The following sub-group reports follow the structure of these diagrams: direct effects of an event, the first impacts of those direct effects, follow-on impacts and final consequences.

Western Australia and Northern Territory

The sub-group mainly focussed on Western Australia, where cyclones, marine runoff and heatwaves were the major threats.

Direct effects: There are a number of weather-related direct effects, such as hotter days, less rainfall and less cloud cover. A direct loss of seagrass (in WA) and a die-off of mangroves (in NT) are the fundamental ecological impacts of marine heatwaves.

First impacts: Weather-related changes to the environment, such as warmer sand and water that causes losses of crustaceans and dugongs and alters sex ratios of turtles.

Follow-on impacts: There are a number of changes to the abundances of different species, including fewer marching crabs, shellfish (e.g. conches), fish (e.g. black snapper) and spider shells. These changes result in changes to, and loss of, traditional fishing spots. Fewer coastal plants due to increasing temperatures results in less bush food. There are now more female turtles and crocodiles as a result of altered sex ratios.

Consequences: As a result of the changes, Traditional Owners are uncertain how to manage seasonal changes to Country. As a result of changes to fish abundance, Elders can't fish anymore, which leads to a loss of tradition and cultural practices. Further, there is a risk to traditional fishing licences due to there being not enough fish in these areas. All of these changes lead to a deterioration of people's health and wellbeing.

Tasmania

Direct effects: The primary effect is warming water, which affects the entire ecosystem, as well as being a threat to management and knowledge of Country.

First impacts: Kelp forest die-off is the major impact of warmer water. Marine heatwaves also result in species distribution shifts, such as sea urchins taking over the kelp ecosystem, further contributing to kelp loss. Maireeners are dying, as are abalone, which are species of vital cultural significance.

Follow-on impacts: The loss of kelp causes a loss of habitat for abalone and maireeners, leading to further die-offs, and loss of harvest and methods for harvesting. Also, the arrival or expansion of range in species not usually found in Tasmania may result in competition with native species. Turbid waters may increase, making it hard for kelp to re-establish.

Loss of these valued cultural species will mean key cultural practices can no longer take place, leading to a loss of connection and sense of community, as well as an economic loss. The arrival of new species causes questions regarding their management.

Torres Strait and Great Barrier Reef

This sub-group recognised that these regions experience many similar impacts to fauna as the other two sub-groups.

Direct effects: Warmer waters cause changes to key ecosystems, with the primary concerns being coral bleaching and mangrove die-off.

First impacts: The larger changes to ecosystems cause species changes, especially to traditional foods such as fish, oysters, crabs and mussels. There are also soil erosion issues at the tip of Cape York. There is concern that there is nowhere to report changes arising from the direct effects of marine heatwaves.

Follow-on impacts: The loss of traditional foods leads to loss of cooking practices. There will also be fewer family outings to connect with Country and community. There may be a loss of traditional harvesting and hunting, which causes cultural loss.

Consequences: There was concern that there is a loss of concern from youth about caring for Country as a result of lost connections and increasing unsustainability of lifestyles in this region (e.g. more heat leading to using more electricity).

Cascading consequences

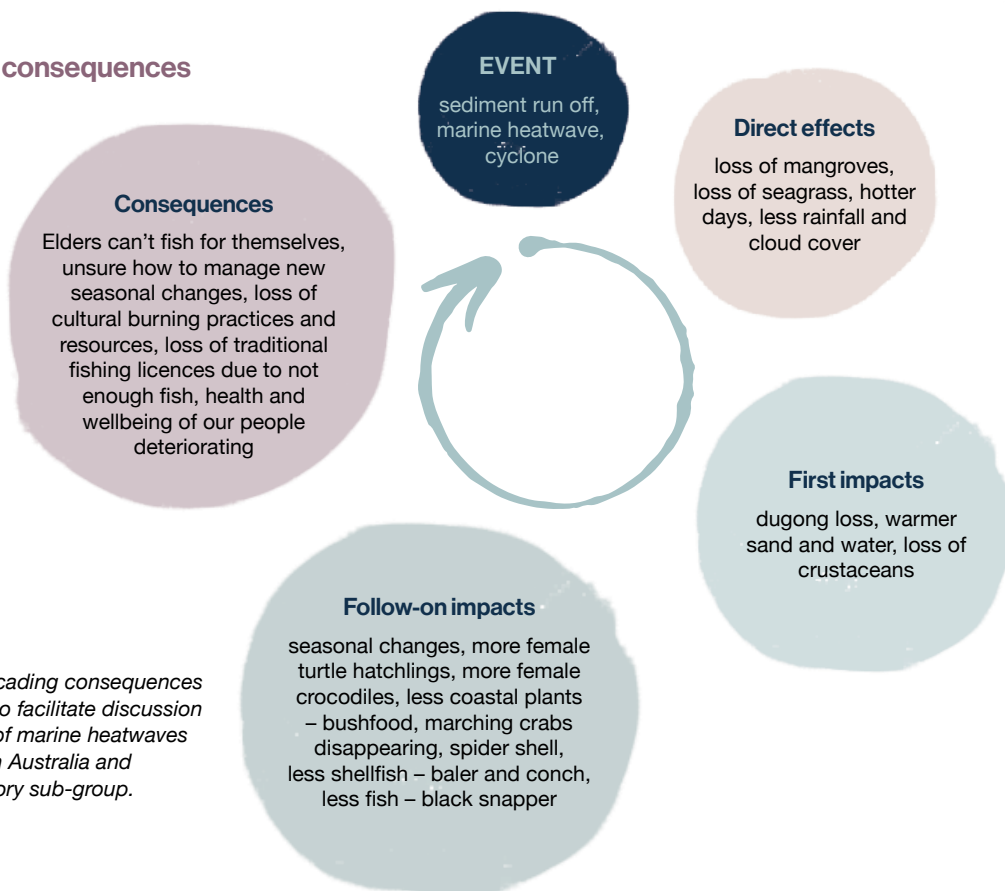


Figure 16: Cascading consequences diagram used to facilitate discussion on the effects of marine heatwaves for the Western Australia and Northern Territory sub-group.

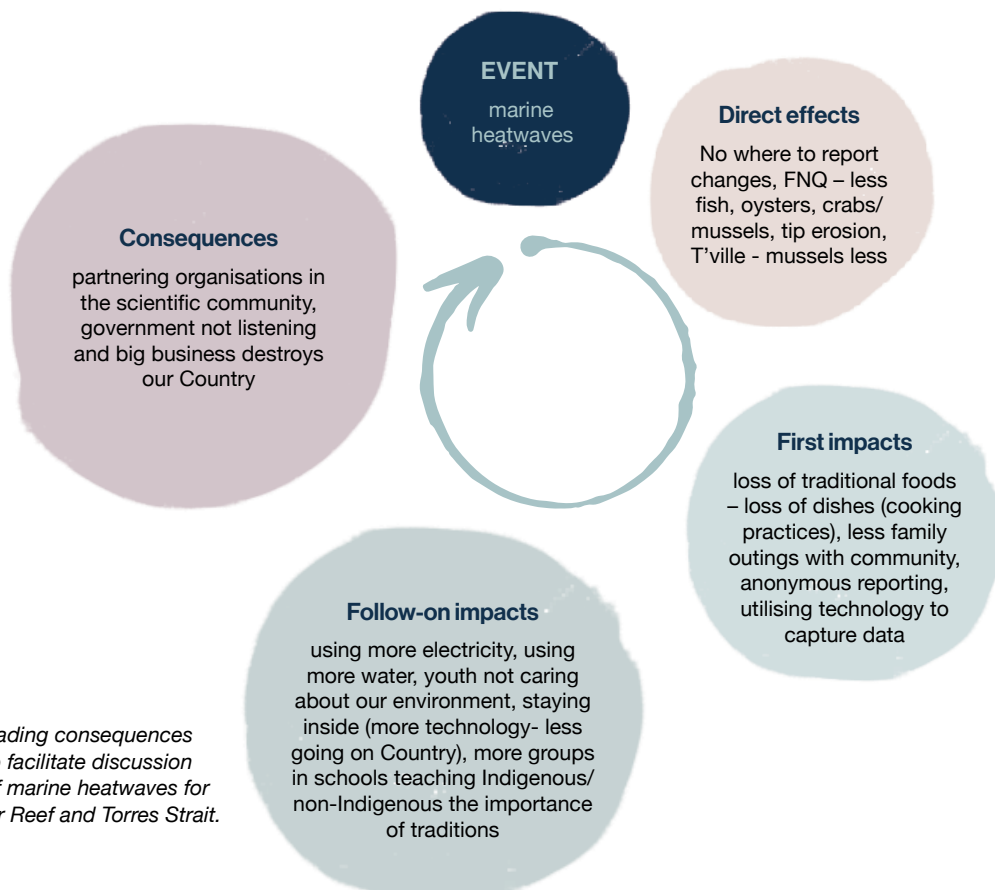


Figure 17: Cascading consequences diagram used to facilitate discussion on the effects of marine heatwaves for the Great Barrier Reef and Torres Strait.



Figure 18: Discussions by the Tasmania sub-group; from right, Simon Marsland (non-Traditional Owner), Taha Cowen, Laura Butler, Learna Langworthy, Birrin Hooper.



Figure 19: Discussions by the Western Australia and Northern Territory sub-group; from right, Nykita McNeair, Gavin Singleton, Sharon Brady, Bianca McNeair, Nicholas Milyari FitzPatrick.

Ideas for possible solutions

A key solution to Traditional Owner management and understanding of marine heatwaves is to facilitate the exchange of knowledge between groups and programs. The WA and NT sub-group recognised that Aboriginal ranger groups should be allowed to take over management of key areas, as these ranger programs can manage Country better. In the Tasmania sub-group, there was excitement over the idea from WA about replanting seagrass and sharing techniques so that kelp could be replanted in Tasmania, with Traditional Owner leadership. There was also a reflection that traditional harvesting practices should reflect the ongoing changes to the environment, and that protected areas specifically for kelp might be important. In the Great Barrier Reef and Torres Strait sub-group, solutions focussed on how to share knowledge and ensure that changes in ecosystems

noticed by Traditional Owners are incorporated into formal targets and reporting. Creating opportunities for integrating this knowledge via technology (e.g. the Atlas of Living Australia) and partnering with the scientific community were identified as a way to make this happen.



Can we try replanting kelp as the mob in WA are doing with seagrass? I think scientists are doing this, but we need to make sure we are involved.

– Taha Cowen, Melukerdee Traditional Owner

3.0 Bushfires and heatwaves on land

3.1 Joint presentations on bushfires

Djarra Delaney, a Quandamooka man from Minjerribah (North Stradbroke Island), spoke about the severity of the 2019 bushfire season. He showed a map of all the fires that occurred across the Country, noting the fires covered pretty much everywhere. He pointed out the history of First Peoples managing bushfire over many years, and the unknown circumstances that are now making that harder.

“

‘We can’t forget that 2019 was the worst bushfire season, perhaps ever ... Our People managed bushfires for so many years before, but there are a lot of unknown circumstances now that are making it harder and harder to manage them.’

– Djarra Delaney, Quandamooka Traditional Owner

David Karoly, a climate scientist at CSIRO working on extreme temperature and heatwaves, discussed research into climate change and fire. David noted that extreme heat is contributing to extreme fire danger, and that fire danger is highest when there is low rainfall, high temperatures, high wind speed and low humidity. The Forest Fire Danger Index combines these factors to rate daily fire danger on a scale of 0 to 100. In dry years, when the fuel is dry, there is significant fire danger.

Although there is natural variability from year to year, climate change will cause more dry years and more dry lightning leading to the ignition of fires. In 2019, new record high temperatures and record low rainfall were set across Australia. This meant there was record high fire danger in Northern Australia and also in the south. Fire seasons are changing. In the future there will be more extreme heat, drier fuel, an increased chance of lightning, and fire seasons will be longer.

‘We know [there will be] increases in fire danger in many areas of land Country for many Indigenous people across Australia, particularly in the southeast, but also in the north ... we know that there is going to be, in dry years, very bad fire danger due to climate change.’

– David Karoly, CSIRO

Jade Gould is a Director of Butchulla Aboriginal Corporation (BAC) and the NESP Indigenous Knowledge Broker. Jade spoke about the October 2020 bushfire on K’gari, Butchulla Country. K’gari is the biggest sand island in the world and central to the dreaming, knowledge systems and opportunities for the future of Butchulla peoples. It is considered a sacred place and Butchulla peoples have a cultural obligation to care for K’gari. Butchulla people’s Native Title rights to K’gari and an area of adjoining mainland are recognised by the Australian government and managed by two Prescribed Body Corporates (PBC), BAC being the PBC holding the rights over K’gari. Queensland Parks and Wildlife Service have sole management of the park and BAC is engaged on Native Title rights. K’gari is listed as a World Heritage Area because of its diverse ecosystems. It is a tourist hotspot and the top-grossing national park in Australia. These features determine how the island is managed by Butchulla peoples and the government.

BAC’s role in fire management during the 2020 wildfires included providing cultural advice to the fire management team, such as knowledge of Country and ecosystems, advice on using freshwater lakes, and knowledge to identify and protect cultural assets. BAC also provided resources to help firefighting, including a representative on the incident management team, community rangers to carry out fire mitigation work, and front-line firefighting.

The October 2020 bushfire burnt over 87,000 hectares of land. Many BAC personnel (more than 60 people) helped fight the fires. BAC had representatives on the incident management team and it was important to be involved in the decision making. However, there were some challenges. BAC found it difficult to get a seat at the table and make it known that the fire was impacting on rights to Country. There were also cultural differences in firefighting priorities – BAC wanted the fire put out straight away while the parks service was focused on threats to assets. The firefighting effort was tough on the resources of BAC as a small organisation, and it was difficult updating people in real-time due to a lack of resources. The fire also took a big emotional and mental toll – Butchulla people who live in Hervey Bay could see the red glow on the island. In general, it is hard to re-introduce cultural burning with current management frameworks and while managing visitor safety.

BAC has been involved in a review into the fire and is working with the parks service to assess the impacts of the fire – the first time there has been an opportunity to assess impacts on cultural assets. In future, the biggest problem will be to better understand how to manage Country in a changing climate, and how to strengthen relationships with stakeholders to better manage fire. Rangers are gaining qualifications for frontline firefighting. The ultimate goals for the BAC are sole management of K’gari and reinvigoration of cultural burning to better manage the island in future.

‘Prior to that [the fire starting] we were managing hot and dry fire conditions ... There were cultural differences with priorities. We wanted the fire out straight away ... A lot of our staff went and fought the fires, something like 60 plus people put their hands up to go ... It was really tough to take the majority of our [small organisation’s] resources for the fire ... It was important for Butchulla Aboriginal Corporation to be involved in the decision-making.’

– Jade Gould, Butchulla Traditional Owner

Discussion after the presentation emphasised the importance of sharing knowledge and experience, the connection between Country and people, the strength and resilience needed when the message in many presentations is doom and gloom, and the importance of moving back to the cultural way of burning.

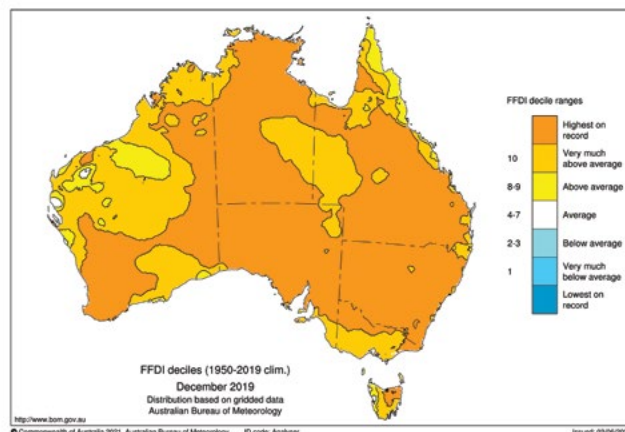


Figure 20: Unprecedented fire danger in 2019–20: Forest Fire Danger Index deciles for December 2019.

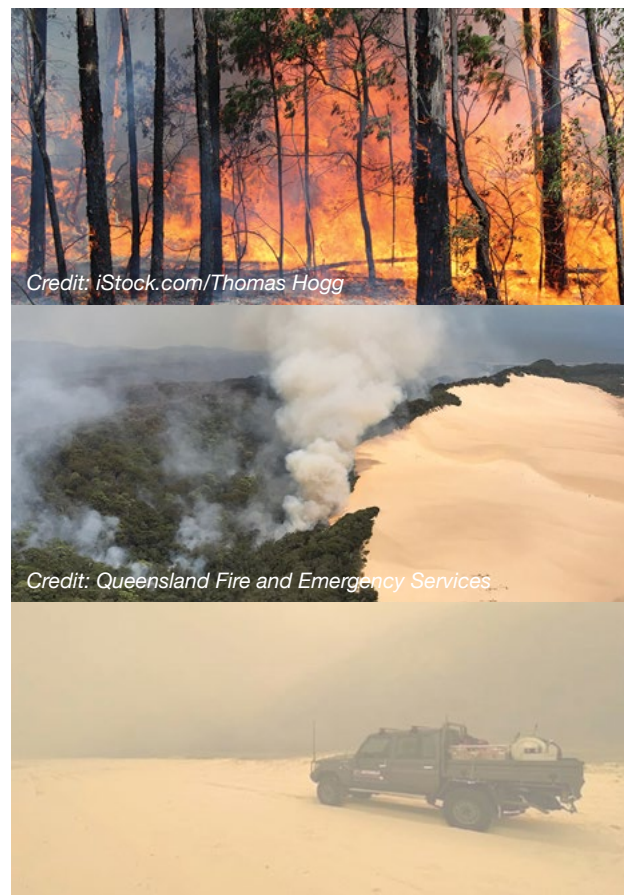


Figure 21: Firefighting at K’gari (Fraser Island), October 2020.

3.2 Joint presentations on heatwaves on land

Gareth Catt, 10 Deserts Project Regional Fire Management Coordinator, spoke about the scientific data for heatwaves on land. Climate change and temperature increases are a global issue and global temperatures have increased by more than 1 °C since 1800. If we don't limit our CO₂ emissions, an increase of 4 °C is predicted by 2100, and some parts of the world will warm more. Data from the Bureau of Meteorology show that the centre of Australia has been warming faster than the rest of Australia. It has increased by about 2.2 °C, which is double the global average temperature increase. Extreme (maximum) temperatures can increase faster than average temperatures.

The *Climate Change in the Northern Territory*⁴ report has a lot of information about how climate is changing in the NT. The number of hot days has increased in recent years, and 2019 was a record year for extreme heat days in many parts of Australia. Tennant Creek tends to be one of the hotter places and had 90 days over 40 in 2019. In the past, Alice Springs had an average of 90 days above 35 °C per year but, under a high emissions scenario, days of extreme heat will nearly double to 172 days a year.

'the centre of Australia has been increasing its temperature faster than the rest of Australia; by about 2.2 °C since 1910. The centre is more than double the global average increase of temperature ... For all the average maximum temperatures – all are hotter ... there is variability, but in all cases the hottest year on record is one of the recent years.'

– Jason Evans, University of NSW

Jason Evans, a professor from University of NSW specialising in regional climate modelling, talked about temperature projections into the future. While the story was gloomy, he expressed confidence that we can reduce our emissions and go in the right direction in the next few decades.

The coming years will see temperatures that we haven't experienced before and longer heatwaves than previously recorded. The projection for the next 80 years, under a high emissions scenario, is for large increases in the number of days per year over 40 °C in Alice Springs, Fitzroy Crossing and Tennant Creek, where more than half the days in a year will be above 40 °C. Cairns will go from

very few days per year over 40 °C now, to several months of days over 40 °C per year. Days over 45 °C are rarely experienced in Fitzroy Crossing, Tennant Creek or Alice Springs now, but in future they will have 2 to 3 months per year over 45 °C.

Heatwaves can also be expected to last much longer, with many more consecutive days in a row of high temperatures than in the past. It is challenging to think about how we might deal with these long periods of hot temperatures. Thirty days in a row over 45 °C would be harder to deal with than if those days were experienced separately. These sorts of temperature changes will challenge our adaptation and liveability.

'Temperatures have been increasing, and extremes [increasing] as much or more than global temperatures ... we will see temperatures we haven't experienced before, and longer heatwaves than previously recorded ... [This is a] challenging issue when you think about how it affects people, and Country – the animals and plants that really struggle to cope with changes in temperature extremes like this.'

– Jason Evans, University of NSW

Gareth Catt introduced the 10 Deserts project. This is a collaboration across a large and connected landscape, including a lot of Indigenous-held land. Gareth is the Regional Fire Coordinator for 10 Deserts and his job is to determine how to deal with the changing fire regimes in the desert. He represented the project and was not speaking for the people. Observations through the 10 Deserts project's work with Traditional Owners and rangers across the region have recorded events such as mulga dying, fewer emu eggs, less winter rainfall, extreme summer rainfall events, waterholes drying up, and kangaroos dying. Reading Country is becoming hard with these changes and extremes. Impacts on people are already being seen; for example, people heading into Port Headland and other coastal towns from the Great Sandy Desert to escape the heat.

'Another impact is kangaroos dying – disappearing across the desert. In the last summer people would go to bush to get shade and would find lots of dead kangaroos that have done the same, but passed away ... Reading Country is becoming hard with these changes and these extremes ... we've got a real problem for future extremes. It's a problem that we need to solve and look at creatively.'

– Gareth Catt, 10 Deserts Project

⁴ NESP Earth Systems and Climate Change Hub. 2020. *Climate change in the Northern Territory: state of the science and climate change impacts*. NESP ESCC Hub, Melbourne. 202

Peter Murray, the Chair of the 10 Deserts project, spoke about how 10 Deserts concentrates on Indigenous land management and how it is one of the biggest projects of its kind. Peter talked about two-way learning and using traditional knowledge and science to measure climate change.

Ngurrarra Rangers and scientists worked together to build projects that could complement what traditional knowledge tells us about climate change, and how we can use data and traditional knowledge to adapt to a changing climate. This project used a painting of a map of traditional Country, knowledge of Country, the stories and songlines of the migration of animals across traditional Country, and when people moved off the desert because of climate change. Weather stations

have been put around the Great Sandy Desert to record rising temperatures, and water monitoring is measuring the impact of climate change in the desert. Rangers are training to capture water movement and quality and to gain certificates two and three in water testing.

Climate change has affected the land. Water is drying up and people are moving right into the Fitzroy River system where it is cooler and there is more bush tucker. Flooding of the Fitzroy River is great for Country because it brings back animal and plant species, but has meant people are cut off from Halls Creek and Derby. Traditional knowledge and results of the projects are being used for decision-making processes. Desert peoples abide by cultural protocols for entering Country and it is important that the right people attend for the right Country.

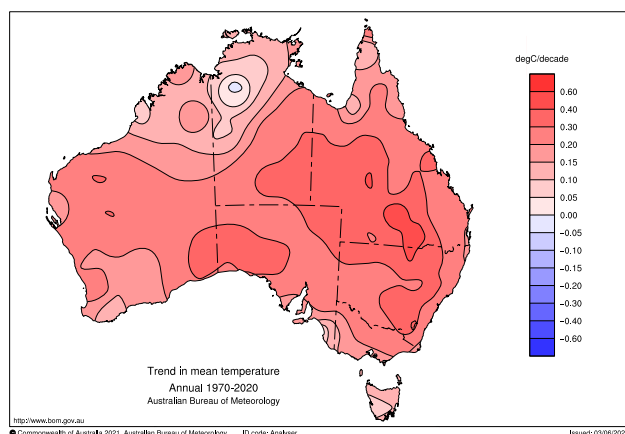


Figure 22: Trend in maximum temperature 1910-2020 ACORN-SAT Commonwealth of Australia 2020, showing central Australia is warming faster.

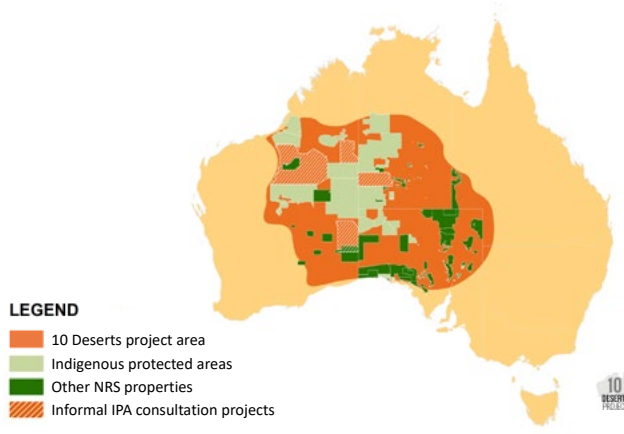


Figure 23 The 10 Deserts area (Gareth Catt presentation).

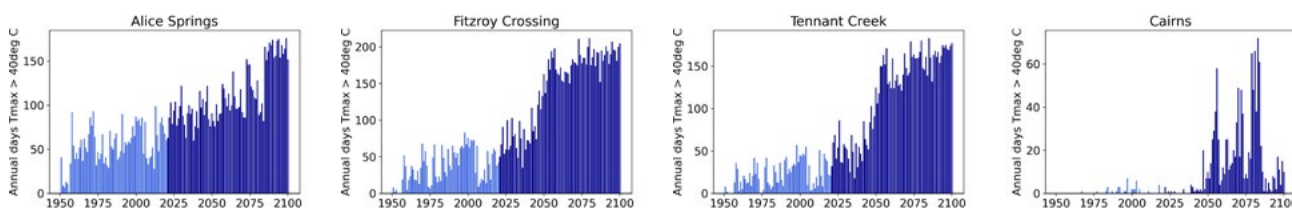


Figure 24: An example of projected days over 40°C in a high emission scenario (RCP8.5) for four locations Jason Evans presentation.

“

Looking at the painting
– it’s a map of our
traditional Country ...
to capture the stories
and songlines of
migration of animals
across traditional
Country and when
our mob moved off
the desert because
of climate change
... we are also using
traditional knowledge,
given that it is needed
for land and decision-
making processes
... We’re providing a
set of knowledge for
the decision-making
process...’

– Peter Murray, the Chair of the
10 Deserts Project



Figure 25: Painting showing map of traditional Country, songlines and stories of animal migrations and when people moved off desert Country due to climate change (Peter Murray presentation).



Figure 26: Ngurrara Rangers (Peter Murray presentation).



Figure 27: Water monitoring – measuring the impacts of climate change (Peter Murray presentation).

3.3 Yarning circles on bushfires and heatwaves on land

The discussion of bushfires and heatwaves on land started with acknowledgement of the devastation caused by drying and bushfires around Australia over the past year. The extreme drying and heatwaves contribute to bushfire conditions. Participants discussed their experiences with bushfires and heatwaves. This led to identifying structural issues affecting First Peoples management of Country and the implementation of traditional practices such as cultural burning. The group also shared positive actions to introduce (or reintroduce) traditional practices that maintained healthy Country and healthy people.



Figure 28: The bushfires and heatwaves participants gather for discussion.

Selected reflections on personal experiences of bushfires and heatwaves

There was a wide range of experiences with fire management. Lance Syme, a Wiradjuri Traditional Owner, spoke of the impacts on his Country in the Blue Mountains, where over a million hectares (or 82 per cent of the Greater Blue Mountains) was burnt in the 2020 fires. Peter Murray, the Chair of the 10 Deserts project, spoke of the importance of bringing desert mobs together to network around the country. Djarra Delaney, a Quandamooka Traditional Owner, talked about communities considering cultural burning and strategies to manage the environment so there are not big burns. He also mentioned that communities are at different stages of reintroducing cultural burning, with some already doing cultural burns and looking after Country, and others just beginning. Carol Hapke, a Gajerrong Traditional Owner talked about documenting cultural knowledge for incorporation into fire management, because Country is becoming hotter. Oral McGuire

(Ballardong Noongar) talked about his experience with managing fire on Country and frustration with the government only listening when there is an economic imperative to do so. The group also discussed the need to adapt in the face of inevitable changing climatic conditions, as heatwaves become more common.



‘We think that the Country is sick. We need to look after the Country, need to visit and talk to the Country and it will heal both the Country and people. [We] live in two worlds – but our old people are only few and heatwave kills many. We need to explain to old people what climate change is about. Country punishing us because we’ve done something wrong.’

– Merle Carter, Gajerrong Traditional Owner

Perceived impacts of heat and bushfires

The group discussed impacts of heat and bushfires, based on their personal experiences, including:

- heatwaves affecting Elders
- heatwaves killing culturally significant species; e.g. flying foxes
- current infrastructure (e.g. housing) being unsuitable for managing heatwaves
- cultural burns being restricted by government due to extremely dry conditions, which increases fuel loads and makes the problem worse
- uncontrolled fires increasing carbon emissions
- large fires resulting in ecosystem shifts from forest to savanna
- increased erosion from large fires
- fires burning uncontrollably through Country, damaging entire ecosystems, which shows that Country is sick.

Structural issues affecting fire management

The group discussed structural issues that negatively impact Traditional Owner fire management, and bushfires more generally. Western approaches can remove people from issues like fire, and disconnects people from Country. There is a general need to 'unlearn' bad habits. A middle ground between knowledge systems was suggested as an important beginning, along with space for Traditional Owners' IP.



'Traditional owned knowledge belongs to the people; that idea needs to be culturally appropriate across the board. It's the culture that makes things strong and the continuation is something given to us from the Elders.'

– Rangi Clubb, Gambir Yidinji Traditional Owner



Figure 29: The bushfires and heatwaves group presents to the Gathering. From right: Tarquin Singleton, Gareth Catt, Jade Gould, Djarra Delaney.

Others emphasised that relationships are what makes agreements work. There is a need for working with park management and government, as there is much work to be done between people before burning for Country. However, governments don't listen unless there is an economic imperative to do so, such as when threatened by huge bushfires. There was also frustration that park management have a rostered system for burning, with set dates. These rostered dates for fires are getting fewer with extreme conditions, but the traditional indicator species suggest this is not the right approach. Incorporating the traditional calendar for burning, according to indicator species, needs to gain more traction. Cultural credits, fire credits and carbon credits were discussed as a way

to fund activities, but funding doesn't come from within Australia. It was suggested that the Australian Government wasn't interested in funding these initiatives.



'Our beliefs and truths get dismissed because we need to provide evidence. We have to justify ourselves as Aboriginal every day... The problem with science is that the intent is the economic imperative. We do things for the economic incentive. What about our cultural law? Who invests in that? ... We have systems, knowledge and structures that create the ability, (but gets ignored) unless there is an economic or dollar value.'

– Oral McGuire, Ballardong Noongar Traditional Owner

Ideas for possible solutions

The action most important to the First Peoples at this session was initiating structural change and recognising the strength and knowledge of First Peoples. Several organisations, such as 10 Deserts, East-West Alliance, Firesticks and NAILSMA, have great potential to unify to become stronger in order to achieve this. A key theme was the need to reinvigorate institutions so that culture and science can come together, so as not to rely on corporate entities and government. Being part of a global society has advantages, especially relating to carbon credits, as this could be a way for the mob to have income to conduct work on Country. To enable this, it was suggested that more work be done on collaboration between carbon foundations and, for example, the Firesticks Alliance.

It was discussed that Country was getting sick because even if cultural burning was set up, it was not truly culturally appropriate. To rectify this, governance is needed that follows the cultural protocols of each region. The governance structure for managing issues such as fires should start with culture, before moving on to interactions with government, park management and other key partners, using cultural protocols as a basis for these interactions. The role of scientists should be to help Traditional Owners get a seat at the table to present knowledge equally and negotiate for Country.

As a first step, it was suggested that those who live on Country must watch and look and listen to changes, to become part of the climate change conversation. Providing basic advice on starting cultural burning programs to communities who are just beginning is vital. Unity was emphasised, as Traditional Owners are stronger together as a people: working locally won't do much but working together may enable the structural changes required.

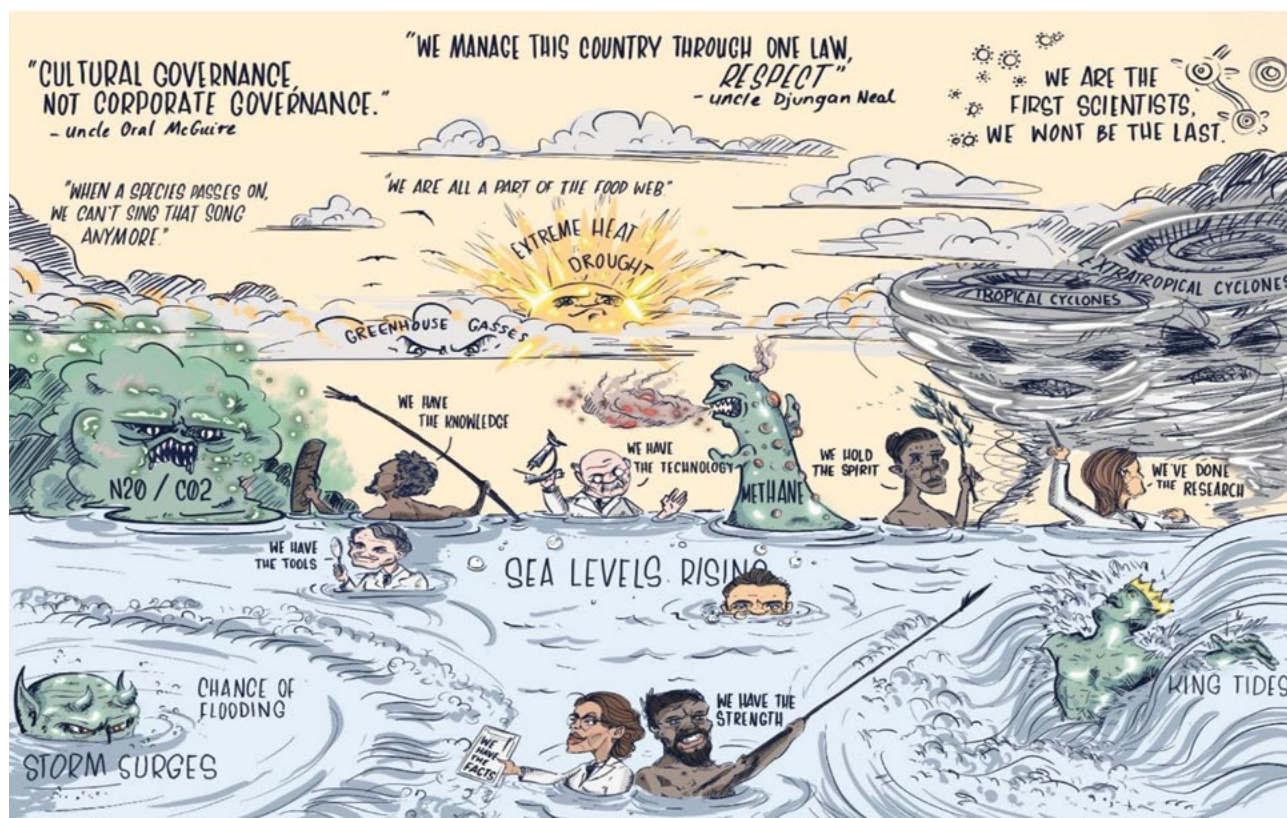


Figure 30: Jade Gould (Butchulla Traditional Owner) presents to the Gathering.

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‘In this room alone, we have the capability to bring about change. We were wanting to bring our presence to the forefront... We sit here in this room as experts in our own right and experts knowing and understanding our Country... I want to be able to say to everyone here, claim your inheritance.’

– Marceil Lawrence, Western Yalanji Traditional Owner



Credit Rhys Paddick

4.0 Extreme water events (dry and wet)

4.1 Joint presentations on extreme water events

Damian Morgan-Bulled, Traditional Owner from the Yorta Yorta Nation Aboriginal Corporation introduced the extreme water events theme. He described the two scenarios of extreme wet and extreme dry, and what is likely to happen under climate change. High rainfall extremes are expected to increase in a warming climate because a warmer atmosphere can hold more water. Extreme wet events are often localised and highly variable from year to year. Extreme dry means drought, and there is a wide range of indicators to define drought. The standard definition used by the Bureau of Meteorology only uses rainfall. Other indicators are used locally, and internationally there are efforts to include indicators such as evapotranspiration.

Sonia Cooper, Yorta Yorta Traditional Owner provided a First Peoples' overview. Wet extremes can cause flash flooding on Indigenous peoples' Country. High rainfall can accelerate erosion on riverbanks and move sediment into foreign areas, causing loss of biodiversity. Flooding can destroy midden sites, birthing sites and scarred trees. Sonia spoke about the importance of language and the need for, and difficulties of, understanding meaning in conversations about climate change. It is important to discuss what climate change, drought and dry extremes are. Distinctions need to be made between local and national, and the topic of accelerated scales discussed. For Indigenous people, a conversation about drought can divert people away from issues such as the legacy of harm to the Murray-Darling Basin system, for example. So it is important to be able to describe what process is causing environmental change. The impacts of climate change are large but can be hidden by language, so it is important to describe them. Millie from the Seed Indigenous Youth Climate Network spoke about taking the butcher's paper back home to have conversations about it in language; to talk about climate change, what this actually means, and what it means in terms of protecting Country. Sonia spoke about the difficulty with definitions of climate change when Indigenous people have their own words for those things.

'What is climate change? What is drought? And what is a dry extreme? ... Impacts can be quite big and can be hidden by language ... I like to have a conversation about it.'

– Sonia Cooper, Yorta Yorta Traditional Owner

Christine Chung, a scientist with the Bureau of Meteorology, talked about climate variability impacts on rainfall. Climate change is described in scientific terms as a long-term change in weather conditions over an extended period of time, for example 30 or 100 years. There is also natural variability in rainfall from year to year. There are many processes affecting rainfall, including the El Niño – Southern Oscillation in the Pacific, which switches between La Niña and El Niño conditions, and the Indian Ocean Dipole, which oscillates between warmer and cooler conditions between years. These are natural oscillations, but in a warming world there will be more frequent extreme El Niño years. The very dry conditions preceding the 2019/20 summer bushfires were due to El Niño conditions in the Pacific and a positive Indian Ocean dipole; the 2021 flooding in NSW occurred under La Niña conditions. Attribution of extreme events to climate change is difficult, but a warmer atmosphere holds more moisture, so more extreme rainfall events can be expected under climate change.

Dewi Kirono, a scientist with CSIRO Oceans and Atmosphere, spoke about patterns in rainfall across years. There is variability in rainfall from year to year, from one period to another, and also from place to place (spatial variability). This variability is shown in maps of rainfall across Australia from 1800 to 2000. Climate change is resulting in higher levels of variability and more frequent variability between years. Dewi said defining drought can be challenging because different systems (or applications) use water in different ways and at different periods. There are hundreds of drought indices available. There are also many ways to define the onset, end and degree of severity of the drought. For example, drought duration can be reported differently depending on which index is used to measure it. When developing projections for drought it is important to use more than one drought index to get a more complete picture of drought conditions. The multi-models ensemble indicate

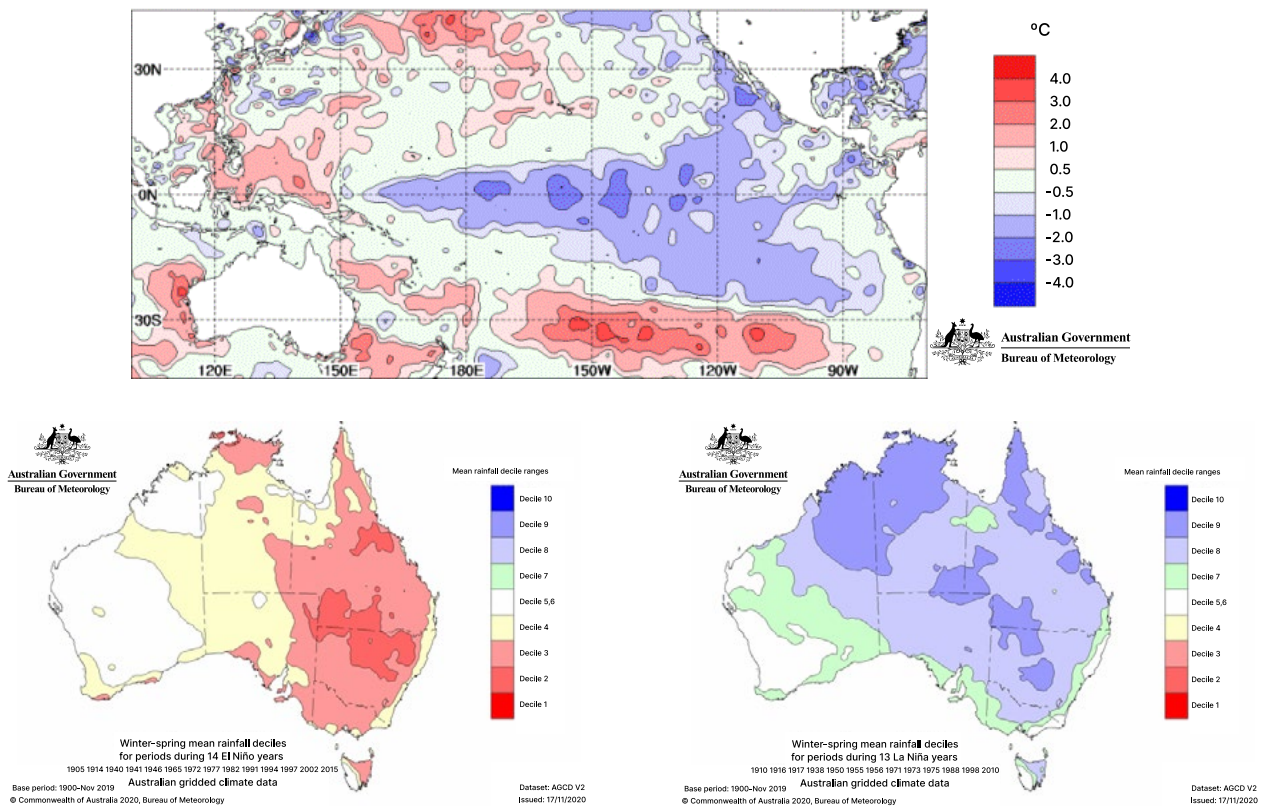


Figure 31: Top image shows the sea surface temperature anomalies in the tropical Pacific during the strong La Niña event which contributed to the Brisbane floods in 2011. This image is for the week ending 16 January 2011.

Bottom left: Australian winter spring mean rainfall deciles averaged for fourteen strong El Niño events.

Bottom right: Australian winter spring mean rainfall deciles averaged for thirteen strong La Niña events.

that Australia will spend more time in drought if projected using a soil moisture index than if measured using a rainfall index alone.

Jason Wilson from Yauwaalaraay/Euahlayi People spoke about a project in Narran, New South Wales on his grandmother's Country, which is called Dharriwaa and is where birds come to nest when the water arrives. Cultural indicators are looked for on Country, such as the likum shrub. This shrub grows only on flood plains and birds come from around the world to nest. Narran is particularly important to birds such as the straw-necked ibis, and has high significance for bird ecology. There are mussels growing there to cook, and some of the largest inland middens. It is difficult to tell whether extreme wet and dry events are natural or caused by human-induced climate change. Less rainfall and longer and more severe droughts mean that flora and fauna are being lost. Because inundation is happening less often, it is not possible to teach young people cultural knowledge.

People know that things are getting worse and they need a plan, so they are using adaptation pathways to decide what needs to be done and when to do it, including what needs to be worked on with government. Indigenous peoples' stories tell of going through the ice age and how to adapt to climate change. Keeping culture strong is important in order to hand knowledge to the next generation, who will pick up the plan started now.

'In extreme climate events it's hard to get a handle on what is [natural and what is] human-induced climate change ... [we are] trying to use adaptation pathways to try to see what we need to do, to prompt us to what we need to do...'

– Jason Wilson, Yauwaalaraay/Euahlayi Traditional Owner

Damian spoke about using a co-design approach, which has involved using Yorta Yorta protocol as well as western science, and has been used in projects on adaptation and freshwater turtles in Barmah forest.

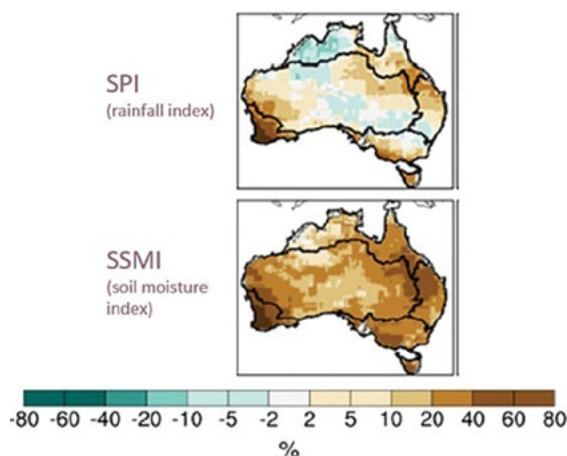


Figure 32: Drought can be difficult to define. This figure shows the differences in projected drought when using (a) a rainfall index and (b) a soil moisture index. (Source: Kirono et. al.)



Figure 33: Keeping culture strong is important in order to hand knowledge to the next generation.

4.2 Yarning circles on extreme water events

Discussion exploring extreme wet and dry conditions centred around participants' experiences on Country, for social and ecological impacts. Participants reflected on ancestral and Elder knowledge about adapting to extreme conditions in the past, and current challenges with water quality. This resulted in a number of recommendations relating to how these issues are integrated into larger frameworks, and how Traditional Owners' management and knowledge of extreme climatic conditions can be recognised.

Selected reflections on personal experiences of extreme wet and dry conditions

The group reflected on a wide range of personal experiences of extreme wet and dry conditions, as well as managing freshwater ecosystems and water quality. Damian Morgan-Bulled, a Yorta Yorta Traditional Owner,

said that there were stories from ancestors and Elders about adapting to climate change, and that Traditional Owners used to be proactive in their response to environmental change. Dennis Ahkee, a Wanjuru Yidinji Traditional Owner, reflected that his experience working in Canberra showed the need to have the capacity to interact with the policy process, which will be important for changing how issues such as climate change are managed locally. Sonia Cooper, a Yorta Yorta Traditional Owner, explained how her experiences in the Murray-Darling Basin showed how the impacts of damming and industries that extract water were affecting freshwater ecosystems, in addition to climate change impacts such as drought. Traditional Owners from Cape York shared how they, as remote communities, felt marginalised from discussions on climate change and how events such as this Gathering can increase connections.

'We need a shared definition of climate change... Our Country, your Country is changing. The actual definitions of climate change are problematic.'

– Sonia Cooper, Yorta Yorta Traditional Owner

Perceived impacts of extreme wet and dry

The group discussed impacts to Country from extreme wet and dry conditions, as well as water quality issues in rivers, such as:

- increased erosion of coast and rivers as a result of intense rainfall and sea-level rise
- impacts on freshwater species: the abundance of freshwater fish has changed
- feral animals such as horses and pigs negatively impacting freshwater ecosystems
- the impact of bushfires and burning on freshwater ecosystems is significant but not well understood
- native fish are struggling to adapt to climate change, and risk being replaced by more adaptable species such as tilapia
- damming of rivers negatively impacts fish spawning, which often only happens in flood events
- riparian areas are being degraded by extreme weather as well as bad water quality: riparian trees don't get a chance to germinate
- industries that extract water negatively affect water quality, resulting in channel building and less available water.

Enabling Traditional Owner participation

The discussion then moved on to reflect on the marginalisation of Traditional Owner voices and how to improve relationships with scientists. Damian reflected that work on Yorta Yorta Country had tried to integrate their knowledge with western science and fill gaps in scientific knowledge. They have done mapping, combined with storytelling from Elders, which allowed visualisation of complex stories into management plans. Des said that even with computer literacy there is a lot of information that is difficult to understand, and that there is a lack of locally relevant climate data on indicators such as rainfall or CO₂ levels. There was discussion on the need to incorporate traditional indicators, which can be incorporated on top of scientific data, and how researchers often don't know how to share relevant data. There was an emphasis on the need for simple tools that can be readily implemented on Country and using relevant language in plans.



‘Elders said that there were fish species that (still) needed to be identified in the Murray-Darling Basin...we will have to go in our middens and find fish remains that don't make the existing fish stock.’

– Damian Morgan-Bulled, Yorta Yorta Traditional Owner

Christine Chung from the Bureau of Meteorology acknowledged that their data can be difficult to understand and access, and there is an urgent need to make such data more accessible.



Figure 34: Damian Morgan-Bulled shares the extreme wet and dry breakout group's results with the Gathering. From right to left: Damian Morgan-Bulled, Sharon Bonython-Ericson.

Networking and support between nations

There was also discussion on the disparities between First Nations in terms of access to resources. For example, some groups are so advanced in their climate change and caring for Country work that they partner with multi-national corporations, while others have very little knowledge and access to information. The Cape York participants emphasised that while this region is relatively new to such work, they are extremely protective of their land and this needs to be recognised. Building networks and sharing between countries was a vital theme in this session, and how to link better-connected nations with those with fewer resources is an important area for future discussion.

Ideas for possible solutions

Ideas for improving Traditional Owner participation in climate change planning, including extreme wet and dry conditions, centred around the fact that climate change impacts and impacts on culture cannot be separated. Therefore, there is a need to take a proactive adaptation approach that uses local language in planning and incorporates cultural aspects into ecosystem valuation. Nature-based solutions were emphasised, and the challenges of getting funding for small projects need to be addressed by building capacity in applying for funds and working through policies. Sharing tools and knowledge between countries, such as via field trips, will be an effective way of generating new ideas for managing problems on Country. Facilitating the use of Traditional Owner-collected data will be important in such sharing arrangements, and a suggestion for the creation of mob geo-collectors was put forward. Succession planning for when Elders retire will help facilitate a new generation to manage and share knowledge. The creation of products can build on successful co-learning projects, and use new tools such as social media, audio-visual products, performances and workshops to help share knowledge between nations, and between Traditional Owners and western science.

5.0 Sea-level rise and cyclones

5.1 Joint presentations on sea-level rise

Djungan Neal, Traditional Owner from the Djungan Prescribed Body Corporate, spoke about witnessing changes to Country. First Peoples have witnessed and recorded changes to Country, such as volcanic eruptions and sea-level rise (sea level rose 150 m from current levels and then receded). In the middle of Gurrigun Island you can still see old beaches, and Djungan people have stories about the crisis and how they got together and adopted new kinship and hunting laws. Even though sea level changes, the Country doesn't change. The stories are still there and there are still places under the sea that Djungan people know about.

'In the coming years when they [the places on Country] go back underwater it will still be culturally significant to us.'

– Djungan Neal, Djungan Traditional Owner

Samarla Deshong from Konjimal People and the Traditional Owners Reference Group spoke about changes on Koinmerburra Country. Samarla shared a photo from an aerial survey fifteen years ago that showed a different coastline, with a big fish trap. The water is a lot higher now and a lot of the flat area on the hills has been eroded by surges and tides. The area was a culturally significant site for people from the northern end of Country.

'Up on the hills a lot of the flat area has been pushed away by the surges and tides.'

– Samarla Deshong, Konjimal Traditional Owner

Hilda Mosby, from the Torres Strait Regional Authority, spoke about changes in Torres Strait. There are six low-lying islands: two top western islands and four central islands (Coconut, Yorke, Sue and Yam), as well as coral cays. The biggest threat from sea-level rise is coastal erosion, which affects food and fuel delivery. There is a high cost of living. People see that changes always have happened and always will. However, with climate change, changes are happening faster than in the past.

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‘Climate change changes the usual. Changes are happening faster than they have in the past ... the biggest threat is coastal erosion, which impacts service delivery for food and fuel.’

– Hilda Mosby, Torres Strait Regional Authority

Kathy McInnes, a scientist from CSIRO's Climate Science Centre, said sea level has risen by about 30 cm over the past century. This means that king tides and storm surges are having greater impact. If global warming is limited to 2 °C, sea-level rise will be between 20 and 60 cm by 2100, but it could rise much more. Climate change is affecting both the frequency and size of storm tide events. While it is possible to cope with the occasional extreme event, it is hard if it is happening often, such as every year. For example, the chance of Cairns being flooded by a 1-in-100 storm tide event is currently 1 per cent, but that rises to 37 per cent by 2050 and 100 per cent by 2100 under climate change. The 1-in-100-year storm tide is also expected to be higher under climate change, flooding a greater area.

Weather also affects sea levels and can increase the impact of storm surges. In northern Australia and the Gulf of Carpentaria region, during tropical cyclones low pressure pulls the ocean up and winds push water up, combining to cause higher sea levels. The intensity of tropical cyclones and other low-pressure systems such as East Coast Lows may increase under climate change. Spring tides and storm surges during the monsoon season contribute to inundation and erosion in Torres Strait. In the northwest, the very large tidal ranges combined with tropical cyclones can drive storm surges. Along the west coast, a stronger Leeuwin Current contributes to seasonally higher sea level, raising the background sea level. On the south coast, cold fronts and Southern Ocean swells are expected to be a major source of storm surges.



Figure 35: This photo was taken by Matt Bloor in Koinimburra fifteen years ago and the water is a lot higher now. Up on the hills a lot of the flat area has been pushed away by surges and tides.



Figure 36: Yarrabah Bay looking towards Gura Buna Gungganhji Country. Photo by Djungan Neal.

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‘Many generations are going to be dealing with sea-level rise ... If we limit it [climate change] to 2 degrees then sea rise will be between 0.2 and 0.6 m, but if it doesn’t stop we can have 5 m by 2300.’

– Kathy McInnes, CSIRO

Djungan talked about future changes for Yarrabah (Cairns region), which will experience extreme tides almost every day by the end of the century under climate change. Hilda spoke about future Country changes in Torres Strait and that building community resilience and adaptation will be critical.

Following the presentation, there was discussion about whether the way that Indigenous peoples manage climate changes, land and sea is recognised. The difference between the caretaker role of Indigenous people and western approaches, and the rights to take care of Country, were also discussed. The large impacts on Torres Strait were noted. There is a need to talk about the impact on people and climate refugees coming from Torres Strait. Gudjugudju talked about people and animals moving due to sea-level rise and how it has happened before. Gudjugudju spoke of Bama peoples being left out of climate change conversations, and the need not only to be talking but also to seriously do something about it. It is the next generation that will be affected and the stories will be underwater. A statement from the Gathering needs to be produced for the next generation.



Figure 37: Cairns storm tide inundation projections (<http://coastalrisk.com.au/viewer>). 2050 (left): 1-in-100-year storm tide (2.13 m) + 0.27 m sea-level rise; (b) 2100 (right): 1-in-100-year storm tide (2.13 m) + 1.14 m sea-level rise.

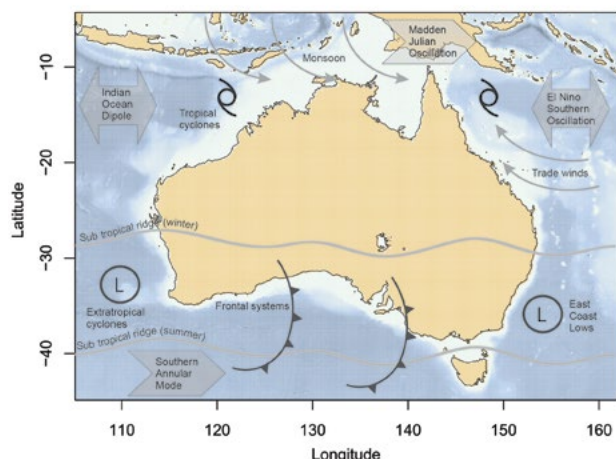


Figure 38: Both weather and climate change affect sea levels. Around Australia, factors such as East Coast Lows, frontal systems and cyclones are examples of effects on sea level. Source: McInnes et al. (2016).

5.2 Joint presentations on cyclones

Djungan Neal, Traditional Owner from Djungan Prescribed Body Corporate, described the impact of cyclones. Cyclones impact physically and emotionally and on all living things. Contrasting values play a role when discussing the impact of cyclones: some people value mines and big buildings, others value families and kinship. The natural indicators of cyclones include humidity and tree movements from changing winds, while the movement of insects and birds can help predict that a cyclone is coming. Scientific indicators include satellite data and weather models. Before a cyclone, people use pre-cyclone management strategies that include collecting seeds, bush tucker and bush medicine, preparing for fishing, and preparing stores. People worry about the future and being able to care for Country. Extreme weather events slow things down and heal Country.

Cyclone Mahina in 1899 (Bathurst Bay cyclone) was one of the biggest and deadliest cyclones recorded. A 15 m storm surge swept over a camp and reached five km inland. Aboriginal people helped the survivors of a shipwreck. Around 100 Aboriginal people were killed, but this is not recorded. In 1918, the Hull River Aboriginal Settlement was abandoned due to severe cyclone damage and over 100 Aboriginal people were reported killed. There was a relocation from Hull River to Palm Island.

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‘Cyclones are both predictable and unpredictable and we both bring them and send them away ... movement of insects and birds gives an idea that something is coming and can help us predict ... along with satellite data ... we also welcome extreme weather events to slow it down, heal our Country.’

– Djungan Neal, Djungan Traditional Owner

Samarla Deshong of Konjimal People and the Traditional Owners Reference Group described the Mackay cyclone of 1918. There was a large loss of life and the cyclone-affected areas 200 km inland. Samarla’s grandmother tells stories of loss of life while bringing cattle over the river for farmers.

Hamish Ramsay, a research scientist at CSIRO, described what science is saying about cyclones. High-intensity cyclones are increasing and more intense cyclones are expected. The time that cyclones are spending at higher intensities is increasing in both the Pacific and Indian Oceans. It is hard to estimate how many cyclones there were before satellite data were available as usually only the ones that hit land were recorded. There appears to be a decrease in the number of cyclones overall in Australia since the 1980s, but no change in the Great Barrier Reef area.

‘High-intensity cyclones are increasing and [we can] expect more intense tropical cyclones ... the fraction of time that cyclones are spending at category 4 is going up ... these are the most devastating cyclones.’

– Hamish Ramsay, Research Scientist, CSIRO

Djungan described the impacts of cyclones on humans, including risk to life, food and water security, and medical supplies. Cyclones also can result in relocation and affect coastal development. Their environmental impacts include habitat loss, risks to animal safety and life, and land management difficulties. Positive impacts include halting the economic threats on Country, an immediate reduction in carbon, healing of Country, cooling the reef, and a short-term boost to the economy from recovery efforts. Recommendations for responding to cyclones include more funding for First People rangers, funding for First People businesses and for people to care for

Country and be the drivers of business. True recognition of traditional values and operating sovereignty were also recommended.

After the presentation, there was an observation that cyclones clean up Country but they seem to be getting more vicious. Dancing and singing and talking to the spirits happen for cyclones. There was a discussion about cyclones causing a lot of disruption to coral under the sea surface in the Great Barrier Reef, even though an increase in the number of cyclones has not been observed. Cyclone energy does a lot of damage to corals. The reef feeds many people and there are 72 groups that rely on it. Reefs are susceptible to damage at 1.5 °C of warming, and if the warming continues there might not be much reef left.



Figure 39: The Mackay Cyclone of 1918. Mackay Regional Council Libraries.

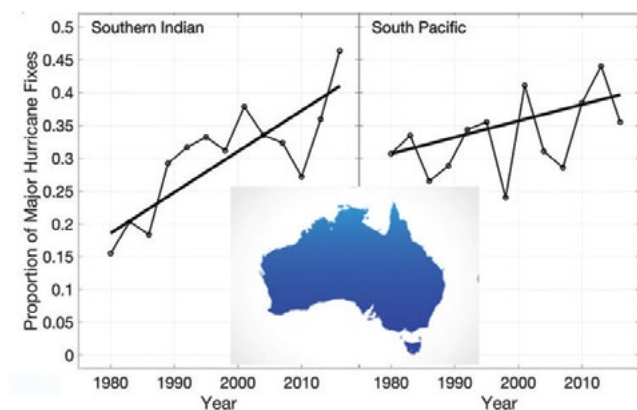


Figure 40: The fraction of high-intensity cyclones is increasing in both the Indian and Pacific Oceans.

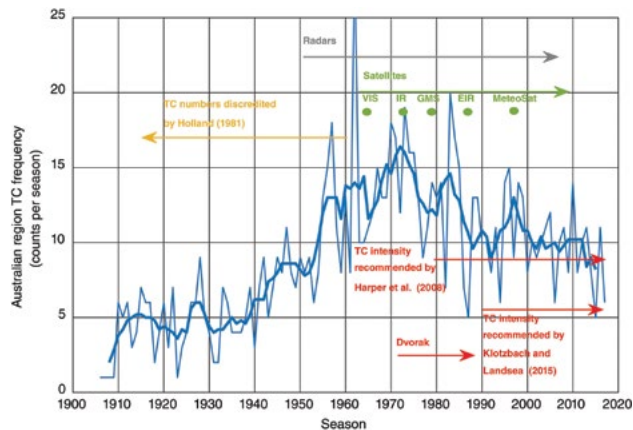


Figure 41: Australian region tropical cyclone (TC) frequency indicating the potential influences of monitoring methods and technologies on the best track database since 1900. Wiley Online Library (<https://onlinelibrary.wiley.com/doi/abs/10.1002/wcc.602>).

5.3 Yarning circles on sea-level rise and cyclones

The breakout session on the combined problem of cyclones and sea-level rise started with attendees introducing themselves, discussing why they are interested in these issues, and sharing personal and ancestral stories about cyclones and sea-level rise. The effects of cyclones and sea-level rise on different Countries were discussed, followed by sharing of stories collected from Elders. The Gathering explored the role of science and traditional knowledge, and made recommendations based on the foundation of recognising Traditional Owner knowledge as equal.



Figure 42: The cyclone and sea-level group present to the session. From right: Lucy Graham, Wynston Shovellor-Sesar, Leah Talbot, Gudjugudju, Levi Lee.

Selected reflections on personal experiences of cyclones and sea-level rise

The group had a wide range of personal stories to share about cyclones and sea-level rise. Gudjugudju, from the Gimuy Walubara Yidinji nation, shared how his family is intricately connected with the changes in sea levels and the wet season, and how his family's names come from these events. Djungan Paul Neal, a Djungan Traditional Owner, discussed how Yarrabah Country was biologically unique, but when there are many cyclones come in the same period it's impossible for ecosystems to recover. Hilda Mosby from Torres Strait shared that the changes to her Country are obvious compared with 40 years ago, and how the climate affects everything because of the connections between land, sea and air. Judith Ketchell, also from Torres Strait, talked about how sea-level rise is a massive issue for them, along with local issues such as ghost nets. Leah Talbot, a Yalanji Traditional Owner, shared how she has been working all across the Wet Tropics with different groups to understand how climate will affect people. She emphasised that now is the time to start having conversations about actions. Natasha Bell, a Western Yalanji Traditional Owner, discussed how cyclones are needed for water and rains, and that big cyclones are sometimes necessary.



‘We have seen the change. When something changes, we sing about it, that’s our story. We don’t write it down. But those stories need to be listened to. We have been through a number of climate change events already, people need to know what our knowledge is about that story... The thing is that now, that lore has been broken again, but it’s been broken by the colonised disruption of our environment. That disruption is causing catastrophic events globally.’

– Gudjugudju, Gimuy Walubara Yidinji
Traditional Owner

Perceived impacts of cyclones and sea-level rise

Impacts of cyclones and sea-level rise include:

- loss of culturally important sites from sea-level rise, including burial sites in sand dunes and midden sites being washed away
- salt-water intrusion into mangroves from sea-level rise: this impacts fish abundance, especially for the culturally significant salmon
- coral bleaching in Torres Strait from sediments being pushed onto the reef during monsoonal weather
- migration of fish and birds being affected e.g. the eels that travel up and down the Coral Sea
- sea-level rise causing a decline in food sources and opportunities to hunt
- higher tides impacting turtle nests
- monsoon seasons becoming more intense, which impacts infrastructure e.g. the Tiwi Islands have had infrastructure destroyed and there are no cyclone shelters
- monsoonal changes causing environmental change: creeks drying out due to climate change, causing loss of species such as freshwater stingray and native fish
- changes to the seasonal abundance of animals (seasonal calendars): sharks, rays and insects are out of step with the usual seasonal changes.

Stories from Elders and ancestors relating to sea-level rise and cyclones

The group then shared stories they had heard or inherited from Elders, as well as ancestral stories about sea-level rise and climate change. There was a story about how an old fella speared the wrong fish, which caused sea-level rise; that particular fish is now not touched, and that place not visited. There was a story shared about how water lilies, a sacred plant, should not be touched because the rainbow serpent causes flooding. Gudjugudju emphasised that these stories are told for a reason, to tell how to manage Country. Tish (Seed Indigenous Youth Climate Network) as a younger Traditional Owner, was concerned that there are no Elders to sing back the wet season or help with the seasonal transition. Gudjugudju emphasised the role

of the planets and the stars, and how their alignment has changed. For example, the Shark constellation used to tell when the monsoon was arriving, as when the nose of the shark goes over the horizon this indicates the wet season is beginning. This now happens later.

'The water lily grows in the wetlands, they're a sacred plant. We can't pull it out because the rainbow serpent makes it rain and the flooding comes. Also, you can't wash near it, so it stays healthy.'

– Mavis Kerinaiaua, Traditional Owner from the Tiwi Islands

Enabling Traditional Owner participation: science and traditional knowledge

The group then shared their perspectives on western science and discussed some of its current shortcomings in sharing knowledge. Science can be short-sighted as it struggles to incorporate the complexity of systems, and relies on categorisation without taking into account connections. It was emphasised that reading Country and using seasonal calendars can give much of the same information as western science, such as predicting monsoons, storms and heat. The group then reflected that, because seasons are changing, there is a need to update knowledge and tools such as seasonal calendars, and that science can help to understand those changes.

The group then talked about how traditional knowledge is not valued equally to western science, and space isn't given for that knowledge in planning, policy and management. Research in communities is often conducted according to what the scientists want, without asking what communities want to know.



Figure 43: Djungan Neal, Savin Chand, Hamish Ramsay, Samarla Deshong presenting on sea-level rise and tropical cyclones.

Ideas for possible solutions

The foundation for this breakout group's solutions was the recognition that Traditional Owner knowledge is equal to, and should be valued by, western science. There was reflection on the importance of key Traditional Owners, who are also scientists and can create ways to talk between the knowledge systems. More such people are needed to help to plan for climate change impacts and use language that can be understood. There was also a need to legitimise different knowledge systems, which includes changing what it means to be an expert. There is a need to set the research agendas based on what is needed on Country. Scientists also need to recognise that traditional knowledge has validation protocols just as western science does. Finally, creating disaster resilience plans that provide solutions from both traditional and western knowledge systems are needed for planning for cyclones and sea-level rise.

To achieve such goals the group identified a number of information needs and processes. Firstly, there needs to be consideration of the bigger picture, with information about tourism, mining, and high carbon emission development provided in order to make decisions. This will allow Traditional Owners to work within their cultural management plans. Secondly, there is a need for resources to manage immediate impacts from saltwater intrusion, and to restore mangroves. Thirdly, there needs to be a way to share the protocols with other people, so they know the lore and consequences of visiting Country. Ultimately this comes down to providing resources for people to be on Country, with governance systems that satisfy lore and involve more people, especially youth, in land management

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'Indigenous knowledge is thousands of years of observations. But since the industrial revolution, everything has changed so rapidly that the ways of predicting nature and knowing Country are changing. Science can help understand these changes. But there are a lot of things that science can't do.'

– Duane Fraser, Wulgurukaba and Bidjara Traditional Owner

6.0 Talking with Country

6.1 Palm Cove and Wangetti (crocodile farm)

George Skeene, George Singleton and Gavin Singleton welcomed Gathering participants and, under the shade of the trees at Redden Island (Machans Beach), shared their family history and stories of the local communities.

George Skeene is a Yirrganydji Traditional Owner and has lived in Cairns since 1948. He has researched the history of camps and reserves in the region and has been awarded an honorary doctorate from James Cook University in recognition of his research.

'From 1950–67 there were 20 families in Cairns; because of the control system, they controlled the lives of Aboriginal people. Still trying to control us now. They try and get their way, but we give them a hard time. After 1967, there were many more families living in Cairns and many people came and I forget how many people live in Cairns now. Changes for the better for all of us, slowly. If you come through the systems like we did many years ago, I can see the big change. The environment has changed.'

– George Skeene, Yirrganydji Traditional Owner

George Skeene also spoke of his involvement in the revegetation program Treeforce (**Trees for the Cairns Environment** – <https://www.treeforce.org.au>), which has planted 7,000 trees in the Redlynch Valley, along the river that becomes the Barron River.



Figure 44: Sharing stories under the shade of the trees at Redden.

George shared stories about the importance of language in preserving culture, and an example of resurrecting a language from one person to enable connection back to Country.

“

'That language is special language, it's the only language they could use to get back onto the island, it was a spiritual connection with spirits when walking on Country.'

– George Singleton, Yirrganydji Traditional Owner

Gavin welcomed us in language and recognised the special connection with the Yidinji from the Tablelands through the Barron River, and he acknowledged the People where the Barron River starts. The area along the Cairns foreshore used to be mangroves but the local council has filled the area from the water to the road and created a boardwalk. Some old mangroves still exist. Shorebird monitoring is undertaken as the area is important for migratory birds such as the Ruddy Turnstone, which migrates to Siberia, and the Beach Stone-Curlew.

The flood plains between the Mulgrave and Barron Rivers were a hunting and gathering area for the people, and they would move to higher ground in the wet season. Over time, the Barron River shifted north with the wet seasons, and the barriers built to protect the airport means the river can never migrate south again.

Palm Cove

Gavin shared the local traditional story of historical sea-level rise in the Palm Cove area, and acknowledged others have their own stories explaining historical sea-level rise. Songlines interconnect to make the cultural landscape and seascape. The aim is to weave the storylines back to everyday management. The ranger group is involved in different types of restoration activities and it's one of the most important solutions to managing the effects of climate change.

Sea-level rise

'We've seen some of the modelling of sea-level rise and where it's going to flood. The interesting thing is the areas where it's not going to flood is where some of our camps were – our old people knew about this a long time ago.'

– Gavin Singleton, Yirrganydji Traditional Owner

Changes to sea Country noted by local people include the slow encroachment of mangroves into areas of salt marsh, possibly due to sea-level rise or storm surges that happen every wet season. Many salt marsh ecosystems are being lost and these areas also include cultural sites. Local communities are considering how to manage the cultural sites: whether to relocate them, protect them, or leave them.

Gavin acknowledged that sea-level rise modelling is important for future land management, and for planning to address impacts on People and Country.

'If most of our area is going to be flooded from sea-level rise are were going to be the next displaced people. Cairns is an important place; a lot of people want to come and live here so it will be a home for other people going to be displaced.'

– Gavin Singleton, Yirrganydji Traditional Owner

Heat-waves

Long periods of sun with low wind and no cloud over long periods causes heat stress and bleaching for coral. But coral can recover. Gavin described how the ranger group has started working on coral restoration using lessons learned in Indonesia from the Mars Foundation. The Mars Foundation started reef restoration as a way to improve the health of local workers on their cocoa farms. The diet of local workers is heavily dependent on seafood and fish, but the past practice of dynamite fishing has destroyed the coral and habitat for fish. This loss of access to local fish and seafood had flow-on affects to the local diet and health of workers, and their work attendance.



Figure 45: Attendees at the Gathering explore the area.



Figure 46: On Country at Palm Cove.

'The rangers travelled to Indonesia to get training and have been apply the learning for a year, weaving in the local traditional knowledge about where the restoration should be undertaken and where not to, and making it more sustainable for this particular area.'

– Gavin Singleton, Yirrganydji Traditional Owner

The ranger project involves capturing larva spawn and planting these on plates and growing coral in certain areas. Another method involves breaking coral fragments and placing them on steel to plant.

Temperature increases, sea-level rise and large king tides are affecting turtle nesting sites, as is coastal development, residences along the beach, and lighting that stops turtles nesting.

'The heating of the sand is changing the reptiles and birds laying eggs on the sand. I'm sure everyone around Australia has similar stories about that.'

– Gavin Singleton, Yirrganydji Traditional Owner



Figure 47: Gavin Singleton, Yirrganydji Traditional Owner, talks to participants of the Gathering.

Cultural burning

The ranger program is also starting to work on a cultural burning project. Queensland Parks and Wildlife Service has been changing its thinking in terms of letting Traditional Owners lead fire management on Country, particularly on Aboriginal-owned land, land trust areas, and Native Title land. Other Traditional Owner groups in the area are doing cultural burning and have good relations with Queensland Parks.

There's tension between the traditional landscape, using cultural burning practices to manage a cultural landscape, and what is seen as the (current) natural environment. The Wet Tropics World Heritage Area recognises the current rainforest zone and wants to protect it, but Traditional Owners see this an encroachment into wet sclerophyll forest on which particular species rely.

'We know a lot of this mountain range was burnt traditionally all the way to the peak, but over time and with burning not being implemented the rainforest is encroaching down the hill.'

– Gavin Singleton, Yirrganydji Traditional Owner

Management of tracks in forests, such as bike tracks, are creating gaps, introducing weeds, and increasing fire fuel.

Rangi spoke of examples of burns in early season that are so cool they don't show up on satellite images and are an example of blue carbon. As the burns don't show on the satellite, they are not recognised in state fire mapping – so the state fire authorities attempt to re-burn the areas and instead burn regrowth and also increase the frequency of burning. Other Traditional Owners talked about the importance of managing fire for a healthy Country.

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'Every year we're getting fires that are going into areas that our old people never burned. One of the key important things is to get the fire management back in and doing it our way.'

– Danny Gardner

Rainforest



Figure 48: Members of the Gathering meeting a cassowary.

Increasing temperatures are causing the rainforest to change to dry woodland. Important species are being pushed out of the ecotone – for example, the tree kangaroo which is special to the rainforest. Critical pollinating species are being affected by heat stress. Native bees and other species that need regular wet season and water are being affected because there are more dry periods.

The Gathering heard about the importance of the cassowary – a keystone species, pollinator and creator of highways or story tracks in the rainforest. They migrate down from the highlands and move through the forest, distributing seeds. There are some fruits that will not germinate without passing through a cassowary's digestive system. Cassowaries are losing habitat due to fragmentation and competition with human uses such as roads, bike tracks and walking tracks that allow weeds in and increase the risk of fire. Cassowaries can no longer travel through the forest corridors because of fragmentation and are limited to certain areas. There needs to be more investment in cassowary conservation and habitat rehabilitation, and First Peoples can play a key role. There is hope, with the cassowary seen to be returning to areas of the tablelands.



Figure 49: Members of the Gathering touring a crocodile farm.

Indicators as business opportunities

Gavin spoke of how the Irukandji jellyfish was named after the local Yirrganydji People without consent. The official advice of the safe period used to be from Christmas Day to April but the jellyfish is around for longer periods, possibly because of warmer water temperatures. The Yirrganydji People know not to go swimming at certain times of the year to avoid being stung, and they know the indicators for when the jellyfish are in the water. They were approached to work with scientists on indicators of when it's safe to swim. They were cautious that their traditional knowledge would be taken and then they would be disregarded. It's important to make sure Traditional Owners maintain control of their indicators and that they are valued from the start of the decision-making process.

The group spent a couple of hours touring the crocodile farm, including a boat tour and other exhibits before returning to Cairns.

6.2 Jaragun and Wunjuru Yidinji Country



Figure 50: Dennis Ahkee welcomes participants to Wunjuru Yidinji Country.

Introduction to Jaragun and Wunjuru Yidinji Country

Jaragun Ecoservices is a unique organisation specialising in providing opportunities, through sustainable management of natural resources, for Aboriginal people to work on Country. Jaragun won the inaugural Cassowary Award for Climate Change Leadership from the Wet Tropics Management Authority in 2019.

Dennis Ahkee, co-Director of Jaragun with Liz Owen, is a Wunjuru Yidinji Traditional Owner. He welcomed us to Wunjuru Yidinji Country at Rotary Park at the beginning of the field day.

'Welcome to our Country. This used to be our camping ground, then we got moved ... This stream down here Babinda Creek used to be all populated by Aboriginal people. Right up to Babinda Boulders. As you look into the creek as it is now, you can see the changes that have taken place ... they [the colonists] cleared all the trees and pushed them into the creek.'

– Dennis Ahkee, Wunjuru Yidinji Traditional Owner.



Figure 51: Gathering participants visiting a Jaragun restoration site on a cane farm.

Jaragun's job is to restore the vegetation on the riverbanks, for climate change, to provide habitat for fish and wildlife, and to restore in-stream hydrology. A lot of Jaragun's work is in the Babinda Swamp Drainage Area, around 2,500 ha that used to be a large wetland. It was drained and filled in for cane farms. Many of the small creeks that used to feed into the swamp were filled in. Agricultural drains were put in to drain the water quickly. Creeks that used to meander now follow straight lines along land boundaries.

'Agriculture is not going away so we need to figure out ways to live with this. The important thing is triple-bottom line – environmental, economic, social – plus one, us, cultural [Aboriginal].'

– Dennis Ahkee, Wunjuru Yidinji Traditional Owner.

Jaragun's main issue is the quality of water draining to the Great Barrier Reef. They use woodchips and bioreactors in drains to help extract nitrates before the water goes out to the Reef. Wetlands are needed to extract the nutrients. There is a Catchment Sustainability Plan.

Aboriginal people are central to Jaragun's work across all the research and restoration. They have a good working relationship with several cane farmers who welcome Aboriginal people. When they had their first meeting, one of the farmers said, 'You blokes have got to be involved whatever happens.' Everyone agreed.

Soil health is very important. Jaragun has been doing electromagnetic imaging of the soil types and density down to three metres to help cane farmers with nitrogen management and with effective use of fertiliser and soil ameliorants. They use the maps to identify old underground streams for future placement of larger bioreactors. They are also using an organic-based spray that can reduce fertiliser use by at least 25 per cent.



Figure 52: Jaragun staff explain their work to Gathering participants.

Bioassays show that about 75 per cent of fertiliser is lost in the first flush after heavy rains. Fertilisers also are a big problem in the Ord Valley, where fertilisers go into creeks and the river system. In the Ord, they have insisted on farms having a tailing water system so that they treat and desalinate the water on their own property and use it again.



Figure 53: Babinda Creek.

At the restoration site

Liz Owen explained that Babinda Creek is the steepest shortest waterway in Australia, with huge water flows in the wet season. It contributes 50 per cent of the flow from the catchment to the Russell River. An effective flush with a large volume of water coming through each year is important to stop sediment building up. That's not happening. The creek at Rotary Park was three to four metres deep a long time ago. Relatively recently, in the last couple of years, when they were doing some railway works at the bridge, they uncovered a wagon-wheel from the 1820s buried under nine metres of mud – that is the level of siltation.

The main priority is to try to improve the health and functioning of the waterways in the catchment. If the sediment builds up, it plugs the Russell River. Some people try dredging to remove the sand, but it's like digging a hole in the beach: it just keeps caving in.

Jaragun do a lot of science themselves and get experts in to help. Funding is on a project-by-project basis. For example, on Eubenangee Swamp, Queensland Parks and Wildlife Service want some big trees taken out that are considered pest weeds, to be replaced with native trees; they work in partnership for a co-benefit.

Using traditional knowledge

Dennis Ahkee explained how Jaragun relies on their Elders, particularly with plant identification and bush medicines. They have grasslands around Eubenangee Swamp that they used to burn during the dry season. Now they work with Queensland Parks and Wildlife Service to burn it to control weeds. When fresh shoots of grass come up, wallabies come; it brings the food to the people. Around those sites there's camping grounds, middens, and burial grounds.



'Jaban the eel is the controller of the freshwater. He's the apex predator, the one who keeps the rainbow serpent, Gudjugudju, you met him yesterday, keep him quiet in the water. That's why it's important that we put a lot of effort into keeping the water quality up, for Jaban, to maintain his food chain.'

– Dennis Ahkee, Wunjuru Yidinji Traditional Owner.



Figure 54: Learning about seed pods.



Figure 55: Yarning with the Jaragun staff over lunch.



Figure 56: Gathering participants on Wanjuru Yidinji Country.

Climate change

Liz and Dennis explained the connection to climate change through restoration. By reinstating the system, the fish and other animals have a chance to withstand climate change, they have some habitat to protect them.

Keeping logs in the water helps the fish habitat. It creates deep pools, with eddies, where there are fish. Cyclones are a problem for restoration. Storms open gaps in the rainforest, and the weeds get in. With more of these gaps, the weeds go further up the mountain and spread.

One of the scientists mentioned observations from the past 100 years available at the Bureau of Meteorology that could help their management plan. There are also projections of what will happen over the next 30 years.

Another scientist mentioned that the improvements in water quality that Jaragun are leading will help the reef to withstand marine heatwaves, so that fewer corals are bleached.

Yarning with Jaragun over lunch

Kylie Smith, Blake Smith, Robert Ambryn, Warren Drahm and Amanda introduced themselves as the Jaragun staff, and shared their experiences.

Babinda Creek was one of their main swimming holes when they were growing up, but now it's quite shallow. The farmland practices have resulted in a lot of sediment in all the creeks so it needs to be restored.

Working with Wanjuru Yidinji people is wonderful. We have a good cultural background in this area, stories, and knowledge from the Elders. We love working with this kind of work now, with this crew. We know the area, my grandmother was born up at Babinda Boulders. – Robert Ambryn, Wanjuru Yidinji Traditional Owner

The priority is to try and protect the area, so stories can be passed down and cultural practices still can take place for the younger generation. A lot of the day-to-day work is focused on weed and pest control. The team showed a stem injection method with a gun, which injects capsules directly to the trunk of the tree so staff don't have to handle the chemical. They replant with native trees, figs, palms and about 150 different species.

Babinda Boulders

Everyone enjoyed the visit to Babinda Boulders on the way back to Cairns.



Figure 57: Gathering participants enjoying the Babinda Boulders.

6.3 Great Barrier Reef

Jiritju and Gudjugudju, Gimuy Walubara Yidinji Traditional Owners, welcomed the group on board a vessel for a tour of Green Island (via Admiralty Island) on the Great Barrier Reef.

Mangroves and ancestral histories

As the group sailed out of Cairns, Gudjugudju pointed out the mangroves prominently located on the foreshore of the coast. He explained that the mangroves play an important role as part of a broader ecosystem. Mangrove knowledge stretches far back and there were various stories shared in his family. On telling the group one of the stories, Gudjugudju explained that reason why we [Traditional Owners] relate these stories is because of their long history:

'There's four different types of mangroves that we utilise. They are actually part of our environmental system as well. If we have less of them then a lot of our quality of water is not going to be too clean. The red ones we make boomerangs out of because they're already curved in that shape. The flying foxes also roost in mangrove systems and help to propagate mangroves. So even though the mayor of Cairns or Bob the Builder wants to try to get rid of all of our flying foxes species, the thing is flying foxes are like the cassowary. They plant or help to plant a thousand different species of plants.'

– Gudjugudju Fourmile, Gimuy Walubara Yidinji Traditional Owner

Climate change and cascading impacts

Gudjugudju described the climate change impact on Country as one of many disruptions affecting First Peoples. It was clear that climate change had created a series of cascading environmental impacts affecting resident plant and animal species, and in turn, Traditional Owners, through their deep connection to Country.

If you've got a group of young people in the room and there's an adult keeping them in order, he's the biggest person in that room. You take him out, what's going to happen with all the young fellows? They're going to have a big fight. So that's the same like our river systems. You take the big fellow out of that water and the young fellows are going to go mad. They're going to say... He used to live up there in that big place. Look, I'm going to go there now.

– Gudjugudju Fourmile, Gimuy Walubara Yidinji Traditional Owner



Figure 58: On a glass-bottom boat tour at Green Island.

Making climate change personal

Gudjugudju focussed on specific climate change impacts taking place. He connected this back to climate information and projections that were available for the area, as well as to the storytelling that he had mentioned earlier.

In 2030-40 Admiralty Island will be underwater. So this system will be gone in a sense. It will always be remembered. So when we do that story about the cassowary and that dance we won't be able to connect it to this Country. We will, but it will be underwater.

Gudjugudju Fourmile, Gimuy Walubara Yidinji Traditional Owner

Gudjugudju explained the need to make climate projections relevant to First Peoples and why it is important for scientists to put climate change information in relatable terms. He said that First Peoples want to know less about the specific data and modelling for years ahead (e.g. 2030, 2040) and more about what the impacts would mean for them, their children, and their children's children.

'The reason why we relate our cultural stories and our knowledge about these mountains and river systems is [to pass knowledge on to the next generation].'

– Gudjugudju Fourmile, Gimuy Walubara Yidinji Traditional Owner

6.4 Using Indigenous culture to address a changing climate

James Rattling Leaf Snr is Lakota, from South Dakota. He is a co-founder of the Group on Earth Observations (GEO) Indigenous Alliance, a principal investigator at the North Central Climate Adaptation Science Center at the University of Colorado-Boulder, a coordinator of Climate Partnerships for the Great Plains Tribal Water Alliance, and Principal of Rattling Leaf Consulting LLC in Black Hawk, South Dakota.

The GEO Indigenous Alliance

The GEO Indigenous Alliance was a vision for maintaining strong cultural heritage, through global earth observation science, data and technology and working together as Indigenous people and allies. Indigenous peoples need to protect and strengthen their cultural heritage, practices, spirituality and land. As a partner they want to work with the global Earth observation group represented by many countries and science organisations to help advance Indigenous people.

The Alliance is working on a report to the UN Global Assessment Report on Disaster Risk and has submitted a COP26 side event focusing on Indigenous women's empowerment. They have been working in Kenya with the Samburu tribe on a data collection application and want to expand the project. They have a partnership with Cultural Survival, working with the Norwegian Ministry of the Environment on empowerment of Indigenous women – training and development of information technology capability.

One of their founding members is from the Amazon and is part of an effort to protect the land through reforestation. They are looking at what information needs they have to do that and planning a Global Earth Observation Indigenous hackathon in 2021.



'Cultural heritage is very important to us, to Lakota people. The oral tradition is part of our cultural heritage. Even in regard to climate change, it's always about looking at the past, considering the present and planning for the future with this (knowledge) in mind.'

– James Rattling Leaf, Snr

James said his people were information gatherers, they captured a story about how the water flowed. Those original creation stories are important. They worked with different kinds of data in the past.

One of his Elders said they need to bring together earth and spirit, earth and sky, spiritually and technically through satellites. James said this is how to approach climate change: products that bring together cultural information and technical data are important. People have knowledge; without satellites, they still knew how to see the land.



Figure 59: A story of a winter camp, written with symbols on buffalo hide.

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‘Cultural heritage is very important to us, to Lakota people. The oral tradition is part of our cultural heritage. Even in regard to climate change, it’s always about looking at the past, considering the present and planning for the future with this [knowledge] in mind.’

– James Rattling Leaf, Snr

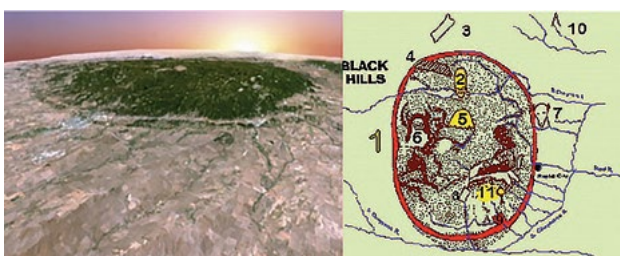


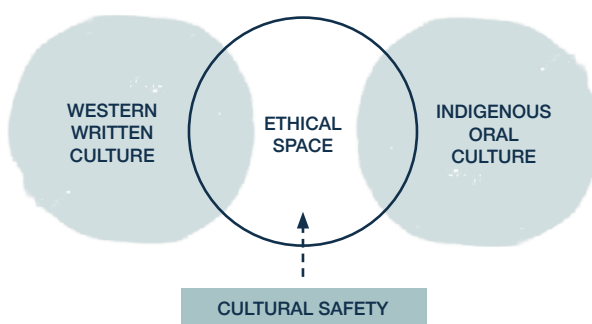
Figure 60: A satellite image (left) and a drawing from an Elder Ca. 1890, both of the Black Hills of Dakota. Legend: 1. Kiyankao canku (Race Track) 2. MatoTipi Paha (Devil’s Tower) 3. Paha Zipela (Slim Buttes) 4. Paha Sapa (Black Butte) 5. PeSla (Old Baldy) 6. HinhanKagaPaha (Owl Butte) 7. MatoPaha (Bear Butte) 8. MniKata (Hot Springs) 9. PteTaliYapa (Buffalo Gap) 10. WakiyanPaha (Thunder Butte) 11. Harney Peak

Indigenous data sovereignty

James discussed the need to understand how data play into nation-building. How can data help governance? How can science help data sovereignty?

The Indigenous Languages decade will start next year. We can’t lose our languages, as that is where knowledge is. Think about Indigenous languages and how they need to be protected, sustained, and used in documents.

Sinte Gleske University has established a World Indigenous Nations Higher Education Consortium. This group has been defining curriculum and accreditation.



Ethical space and reconciliation

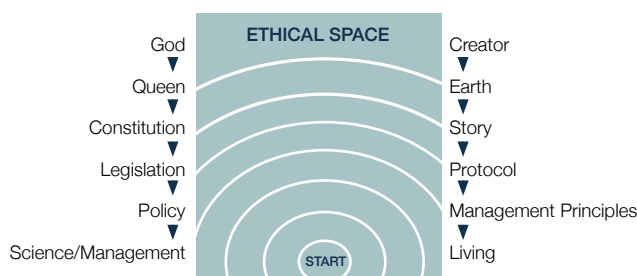


Figure 61: The ethical space is where all knowledges are equal; they have equal weight and legitimacy. And they need to work together.

Different knowledges don’t have to agree. They have to come together with mutual respect, kindness and generosity to prepare for a changing climate.

In Standing Rock, South Dakota, people made a stand against developers for the South Dakota Access Pipeline in 2016 to protect the water. This led to the DAPL (Dakota Access Pipeline) principles:

Respect: water is a living entity; it sustains humanity and all beings and deserves respect in all relations.

Humility: our powerful water also embodies and teaches gentleness.

Interconnection: water connects people to every other being including ancestors and other creatures and the future.

Relationality: water sustains origins and existence; it also informs and nurtures how all beings relate to one another as kin.

Reciprocity: water is a giver; humans have the capacity and responsibility to acknowledge and uphold and care for its gifts.

Albert White Hat said, 'If we are going to save the Earth, I advise you to go back to creation, to communicate with creation and get reattached to Grandmother, the Earth.'

'Indigenous knowledge does not look at the world as if we are detached. Indigenous knowledge and science are needed to re-establish our relationship with the planet.'

– James Rattling Leaf, Snr

6.5 Conference of Parties to the UNFCCC and IPCC

Taha Cowen, a Melukerdee Traditional Owner from southeast Tasmania, a marine Antarctic climate change scientist, and senior Policy Officer in the Department of Industry, Science, Energy and Resources, works on international climate change negotiations under the Paris Agreement.

There have been various international forums on climate change. There is the United Nations Framework Convention on Climate Change (UNFCC), under which the Paris Agreement and the Intergovernmental Panel on Climate Change (IPCC) sit. Other forums include the Convention on Biological Diversity, the World Heritage Convention and the High-Level Panel for a Sustainable Ocean Economy.

IPCC stated in its latest report that Indigenous and local knowledge stands on its own and this is what governments around the world are now basing their policy on. Their report provided a lot of examples where western science wasn't able to provide info [such as] whale stocks.

– Taha Cowen, Melukerdee Traditional Owner Traditional Owner

The Paris Agreement mitigation goal is to hold the global average temperature rise to well below 2 °C. It has a different process from other agreements: rather than setting targets top down, it is a bottom-up process where countries set their targets. This recognises different national circumstances.

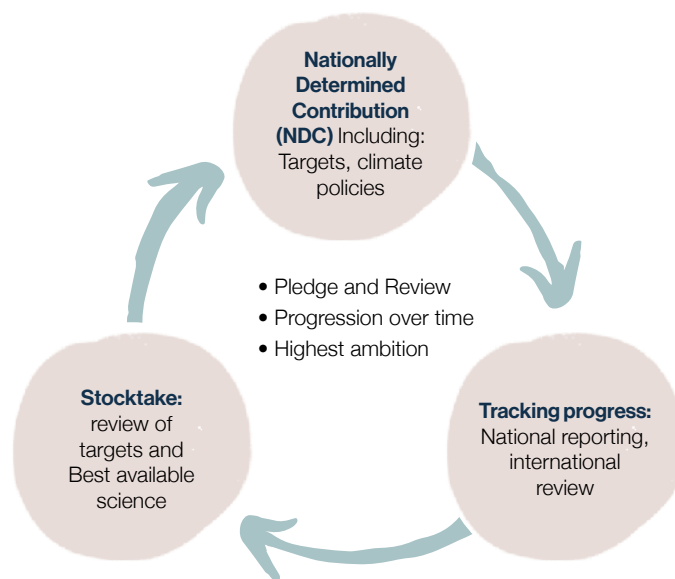


Figure 62: The Paris Agreement process.

The Paris Agreement has been around for six years, with 2021 the year of implementation. There is a five-year cycle to setting targets, progress reporting on targets (e.g. two-yearly), and international review of reporting.

The stocktaking will begin in 2023 to hold countries accountable on the world stage. Australia has set its first emission reduction target of 26–28 per cent on 2005 levels by 2030 and will need to provide a new target in 2025.

Signatories to the Paris Agreement come together at the Conference of Parties (COP). This involves formal processes in which a lot of countries will engage to negotiate rules. Another element is the Action Agenda, which includes the International Indigenous Peoples' Forum on Climate Change. Its purpose is to strengthen knowledge, technology and efforts of local communities and to enable them to be informed and for the COP to hear what they need. It has a facilitative working group where half of the members are representatives of Parties to the Paris Agreement and half represent Indigenous peoples' organisations.



Figure 63: Facilitative Working Group of the Local Communities and Indigenous Peoples Platform at the 2019 meeting.



‘I was at the 2019 COP and the thing that stands out is when I was sitting with all the government officials and hearing all these people and the Indigenous group walked into the plenary singing and sat on the floor and everything stopped. It made a statement. It’s a powerful thing.’

– Taha Cowen, Melukerdee Traditional Owner
Traditional Owner

Gavin Singleton, a Yirrganydji man from the Cairns to Port Douglas region, is a Project Manager with the Dawul Wuru Aboriginal Corporation and coordinates the Yirrganydji Land and Sea Ranger Program and Yirrganydji Traditional Use of Marine Resources Agreement. He said they are doing a lot of positive things that don’t get in the media, so people don’t know that Aboriginal people are still on the reef.

Gavin said COP is a capacity building opportunity for young people, providing an understanding of what it’s like and an opportunity to bring that home to help the mob move forward. It requires political leaders to take action on emissions, energy and carbon, but we all have a role to play on the climate issue. We are part of ancient storytelling and we need balance in environment and jobs, being supported and having resources to look after Country. The government needs to take action, including on immigration (e.g. people displaced by sea-level rise).

‘We can use our storytelling work for aligning regional plans. The messages going into those plans are also being filtered so we need to make sure those voices are going to the top. We need to have access to data on Country and collect our own and read it according to our laws and customs and make sense of it in terms of our connection to Country.’

– Gavin Singleton, Yirrganydji Traditional Owner

Gavin said that Indigenous people have their knowledge and law versus the western system: they are operating in this third space where they share knowledge and stories, going back to their way of music, song, art and media to engage political leaders at the international level.

6.6 Convention on Biological Diversity

Birrin Hooper, a Bundjalung man and Senior Policy Officer at the Department of Agriculture, Water and the Environment, works in the team that negotiates the Convention on Biological Diversity.

The UN Convention on Biological Diversity was created in 1992, along with the two other UN conventions on the environment. Its goals are the conservation of biological diversity, sustainable use of its components and the fair and equitable sharing of the benefits arising from the use of genetic resources.

The EPBC Act was created to implement some of Australia’s obligations under the Convention and has the Indigenous Advisory Committee. Indigenous Peoples and Local Communities have been recognised as leaders in protection of land: 3 per cent of the world’s population is protecting and managing 80 per cent of the world’s biodiversity.

The post-2020 Global Biodiversity Framework (GBF) will be finalised at the end of 2021. There are five goals and 20 targets. One target discussed was the protection of 30 per cent of terrestrial and marine areas worldwide. In Australia, currently 20 per cent of terrestrial area are protected. Currently, Targets 19 and 20 focus on use of traditional knowledge and caring for Country. Birrin talked about the challenges and opportunities in meeting these targets and the integral role First Nations have in achieving success in the protection and conservation of biodiversity.

Indigenous Protected Areas and Commonwealth Funded Indigenous Ranger Groups - September 2020

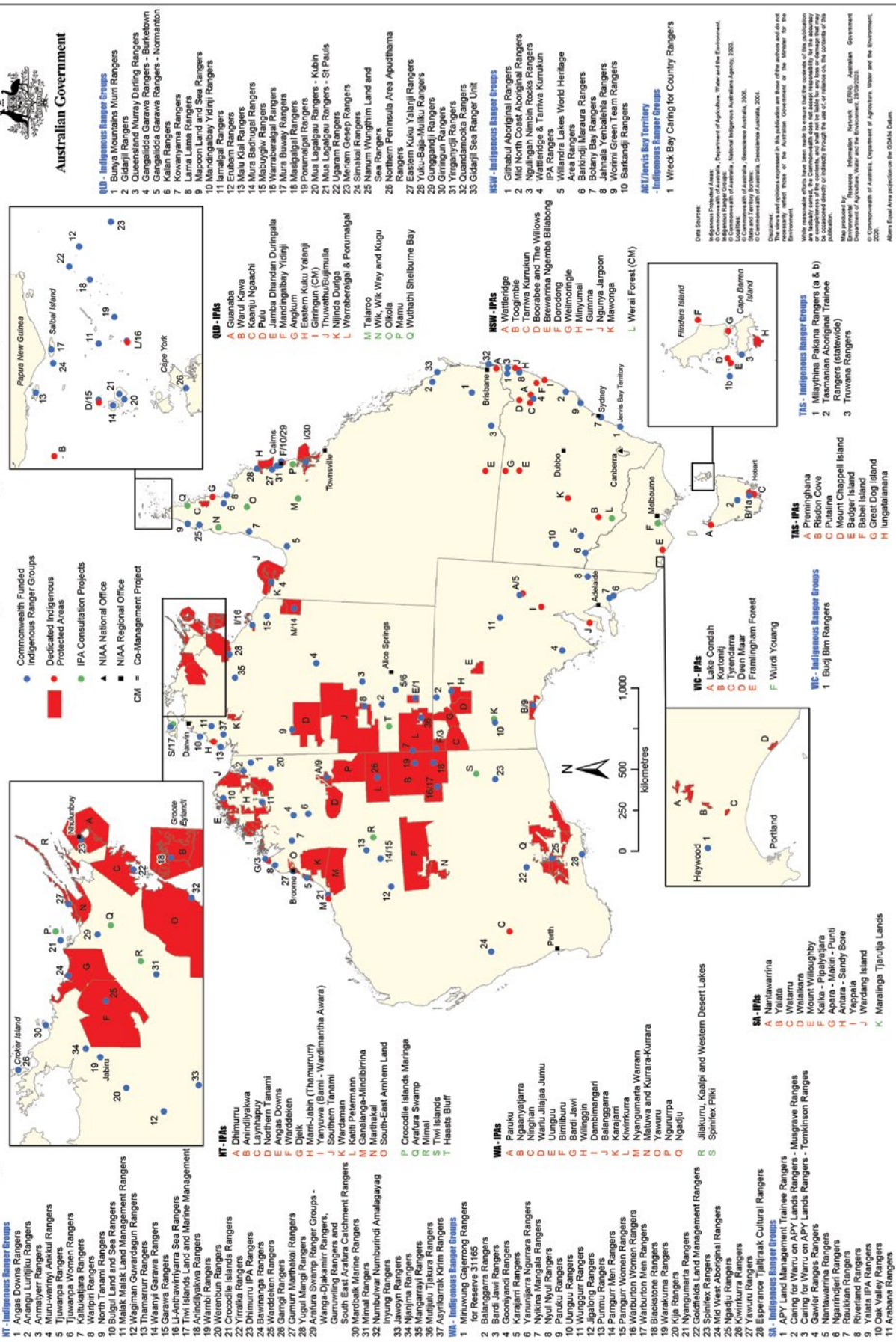


Figure 64: Map of Indigenous Protected Areas.

7.0 Gathering Statement and ways forward

7.1 Drafting the Gathering Statement

The final morning of the Gathering focused participants' attention on drafting a Statement from the Gathering. A draft statement was considered in small groups, who recommended many changes and improvements. The discussions particularly highlighted the seriousness of the challenges faced by Torres Strait Islanders and the value of unity:

“

Relocation is the last thing we want, we are doing everything we can to save our communities ... Torres Strait is part of the whole country, but climate change is a reality for us. We see it every day ... Whilst the whole world is changing, it's reality for us every day. Defence walls are not a long-term solution. We are advocating and we also call on the Australian Government to reduce carbon. I hear everyone's stories from their Countries. We have our own stories. We are so diverse because we come from different cultures. Traditional practices are very strong in some places, we are revitalising. A lot have lost our language and adopted more western ways. We are doing everything we can to bring [language and culture] back. Adaptation and building resilient communities will help us get back to the way we were before. Protecting our islands and our country together with this whole group, the Gathering is very important to be part of for us.

– Hilda Mosby, Torres Strait Regional Authority

Participants highlighted the need for a strong statement highlighting the urgency of the situation, and the need for strong and rapid action, underpinned by a collaborative approach. Culture, connection to Country and law were recognised as central.

7.2 Evaluation

An eye-opening experience. A very illuminating and insightful journey that is relevant to all life on, in, and above the land of our Ancestors! I'll hopefully spend more moments with everyone in the future to be part of the evolving developments in the area of climate change.

– Gathering Participant, 26 March 2021

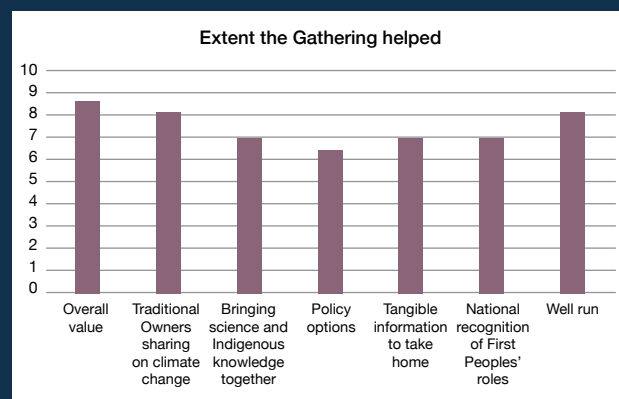


Figure 65: Mean rating of 42 evaluation responders to the goals of the Gathering (Scale 1-10).

Overall value of the Gathering

Participants who completed the evaluation (42) found the overall value of the Gathering to be very high (Figure 65). Meeting, forming new relationships with both First Peoples and scientists, and making connections with people who face similar issues on their Country were identified as the key benefits. Several people commented that they had formed relationships which will continue beyond the forum. The overall goal of Gathering to celebrate, learn from and enhance First Peoples-led climate action was largely fulfilled.



Value for helping Traditional Owners share about climate change

Participants also rated the Gathering highly in regard to its first aim of assisting Traditional Owners to come together and share with each other about climate change:

'It has given us an opportunity to engage other tribes and clan groups and plans and solutions.'

– Gathering Participant, 26 March 2021.

'Making connections with other mobs, learning we all have our own concerns, but we're all interconnected and seeing the value/opportunity in this.'

– Gathering Participant, 26 March 2021.

On the other hand, several participants identified that the opportunity to connect would have much, much stronger if the meeting was held on-Country:

'It has helped build new relationships but would have been better out on Country. A big flash hotel is not true country and identity is better for us out on land.'

– Gathering Participant, 26 March 2021.

The cultural activities were highly valued as part of the approach to achieving the first aim, particularly the field day spent on Country, but holding the Gathering in an hotel was viewed by some as problematic:

'[Cultural activities] were the most important aspect. The chance to be on Country transcends all levels in allowing for frank, effective communication.'

– Gathering Participant, 26 March 2021.

'Cultural activities should always be conducted on Country and not in a conference room.'

– Gathering Participant, 26 March 2021.

Participants who missed the field trips felt that the Gathering didn't have any cultural activities, despite the message stick hand-over and other events, highlighting again the centrality of Country to culture. Nevertheless, the coming together was identified by many Traditional Owners as very helpful for strengthening kinship, cultural identity and wellbeing.

Value for bringing scientific information in a useful format

Participants diverged more about how well the Gathering achieved its second aim of bringing scientific information in a form useful for Traditional Owners. Some Traditional Owners found the science, and the scientists, to be extremely helpful:

'Having access to scientists is crucial to building our knowledge. All were friendly and easy to approach.'

– Gathering Participant, 26 March 2021.

I do feel the experts' studies and efforts have made it possible to compare traditional knowledge to scholarly studies.'

– Gathering Participant, 26 March 2021.

Several Traditional Owner participants did not find the scientific information useful:

'No evidence of how white science can help, my Country has been dramatically affected by white man's science.'

– Gathering Participant, 26 March 2021.

'Too much scientific information in WESTERN language. Needs to be more simplified. Less science JARGON. I don't feel comfortable with scientists using my lived experiences in their research to TICK a box'

– Gathering Participant, 26 March 2021.

Scientists at the Gathering identified a lack of interest in their science:

'Not clear how western science was needed or whether wanted by traditional scientists.'

– Gathering Participant, 26 March 2021.

On the other hand, this negative attitude to scientists was regretted by other Traditional Owners who found the science useful:

'Needs more respect for the science too, some participants didn't want to hear it.'

– Gathering Participant (Traditional Owner), 26 March 2021.

'I met a lot of wonderful people [scientists] and exchanged information for future planning and catch-ups.'

– Gathering Participant (Traditional Owner), 26 March 2021.

There were also disparate views on leadership – one participant identified that First Nations led the conversation in the presence of scientists, while another found that the scientists didn't listen to First Nations at all, that the conversation was dominated by scientists' and government's voices. Some participants identified that they had found new ideas from bringing Indigenous and scientific knowledge together and would have liked more time to work on this and unpack the ideas properly.

Value for identifying policy options

Participants rated the Gathering least favourably regarding the third aim of identifying policy options. The statement from the Gathering was viewed as likely to be the most useful policy option. However, some responders felt that the policymakers needed to be at the Gathering in order to fulfill this aim. For others, the issue is not policy itself, but policy implementation:

'How many conversations are we going to have before our leaders do something?'

– Gathering Participant, 26 March 2021.

Others reported a lot of great conversation about policy options in the groups, including identification that many policies ignore traditional knowledge. More attention policy options could deliver greater value:

'Need more policy discussions and how what we decide here can contribute directly into policy development.'

– Gathering Participant, 26 March 2021.

Value for tangible information

Many participants viewed the Gathering as useful for the fourth aim of providing tangible information, and some felt they would be able to share this with their communities:

'Thank you so much for a wonderful experience. Highly enjoyable and gained so much knowledge to take back to my Country.'

– Gathering Participant, 26 March 2021.

'A lot of information will be shared with community, especially the land-owning groups of my community.'

– Gathering Participant, 26 March 2021.

However, others identified a need for some more tangible products:

'Having a copy of the presentations in printed format with a summary and visualisations would help convey the information back to the community.'

– Gathering Participant, 26 March 2021.

A couple of participants identified the need to learn through feel, see, touch methods, not just hear and see. Others felt the agenda was just too ambitious, as lack of time was always an issue – people had more to say, but the agenda item had to be finished to move to the next one.

Value for national and local recognition of First Peoples' roles

Many participants saw the Gathering as useful for the fifth aim of highlighting First Peoples' roles, but were less confident that this led to national and local recognition – at least not recognition by governments and industry. One participant identified that Traditional Owners voices were spoken over many times.

A Torres Strait Island delegate shared a perspective, disheartened that sea level rise impacting the Torres Strait is a real issue for island communities, and did not receive the attention it deserved. Acknowledgement was made to the Torres Strait Island delegate on how the conference could support their region.

'Myself and other Torres Strait Islanders who attended have left feeling discouraged because yet again our voices aren't heard and we are underrepresented.'

– Gathering Participant, 26 March 2021.

Others saw the role played by the local Traditional Owners as the highlight of the Gathering:

'[Gimuy-Yidinji and Yirrgandji hosts] a highlight for me. I got a lot from learning about the local problems and the areas.'

– Gathering Participant, 26 March 2021.

'Great hosts. Thankyou.'

– Gathering Participant, 26 March 2021.



Suggested actions changes going forward

Several participants identified that they would like to see the Gatherings continue, and to be part of what comes next:

'We need to work collectively and meet frequently to keep the momentum up. We the First People of Australia have a responsibility to take care of our land and sea. The land and sea have provided for our people for thousands of years. Now is our turn to take care and protect our land and sea.'

– Gathering Participant, 26 March 2021.

'Just keep these kinds of forums and workshops going.'

– Gathering Participant, 26 March 2021.

Many possible improvements were identified:

- About being on Country
 - Hold the Gathering on Country.
 - An “action gathering” with both talking and doing on Country.
- About the program
 - Focus on causes of climate change, not just impact.
 - Focus more on solutions.
 - First Peoples to talk and scientists to listen.
 - Everyone Traditional Owner should have an opportunity to present their work.
 - First Peoples and scientists to work together in small thematic groups from the first day.
 - Everyone coming together to share stories after the end of the field trip day.
 - More discussion time and smaller discussion groups on the topics.
 - Greater focus on climate change mitigation and adaptation, and carbon sequestration, the main actions that First Peoples are taking and the science behind it.
 - More time on the previous Statement at the beginning of the week.
 - Invite David Attenborough to the next one.

- About the participants
 - Greater participation by Torres Strait Islanders.
 - Greater involvement of peak bodies to connect with Traditional Owners to attend the gathering e.g. Land Councils, Ranger groups.
- About the logistics
 - Different food (less sweet) and food available all day.
 - Provide basic fact sheets on each Theme area.
 - Opportunity to come early so as not to miss the start.
 - A flow chart for the agenda each day.
 - Everything should be changed, the Gathering was badly organised.
 - Nothing should be changed, it was perfect.

Many participants thanked the organisers for a wonderful Gathering.

7.3 Ways forward

The evaluation identified that the Gathering was overall of great value, and that much more work is needed. What develops from here is important. The Gathering between Traditional Owners has proven benefits in terms of peer-to-peer learning, while the actions to bring science to Traditional Owners in ways that are useful, and achieve wider recognition of First Peoples roles and thereby better policy options, are still very much works-in-progress.

Co-Chair Bianca McNeair summed up the strength Traditional Owners found in one another at the Gathering:

“

‘Coming together as one voice and people. We are stronger together and our connection to Country is needed more now than ever in our lifetimes. With our little footprints we can provide a big future for next generations. A future our next generations are proud of. We are thankful for our ancestors and our people’s resilience and provide a spirit that is still strong in our knowledge and our hearts. We can face a situation of doom and gloom and still bring strength to one another.’

– Bianca McNeair, Malgana Traditional Owner, Co-Chair of the Steering Committee for the Gathering

The National Environmental Science Program (NESP) Climate Systems Hub leader, Simon Marsland thanked the Gathering on behalf of the scientists:

“

‘Thank you to all the mob here ... humbled by the experience and really happy to join together. I don’t have connections to Country but by joining together, that’s how we get power in this world. We have had conversations during this week which have been fantastic. I hope it has helped to move forward. We fully support this and will continue the dialogue. The big message that we have heard is that we need to focus on solutions. We need to start the journey together that can be passed on from community to community and help to transfer knowledge in any way we can. We need to continue the engagement.’

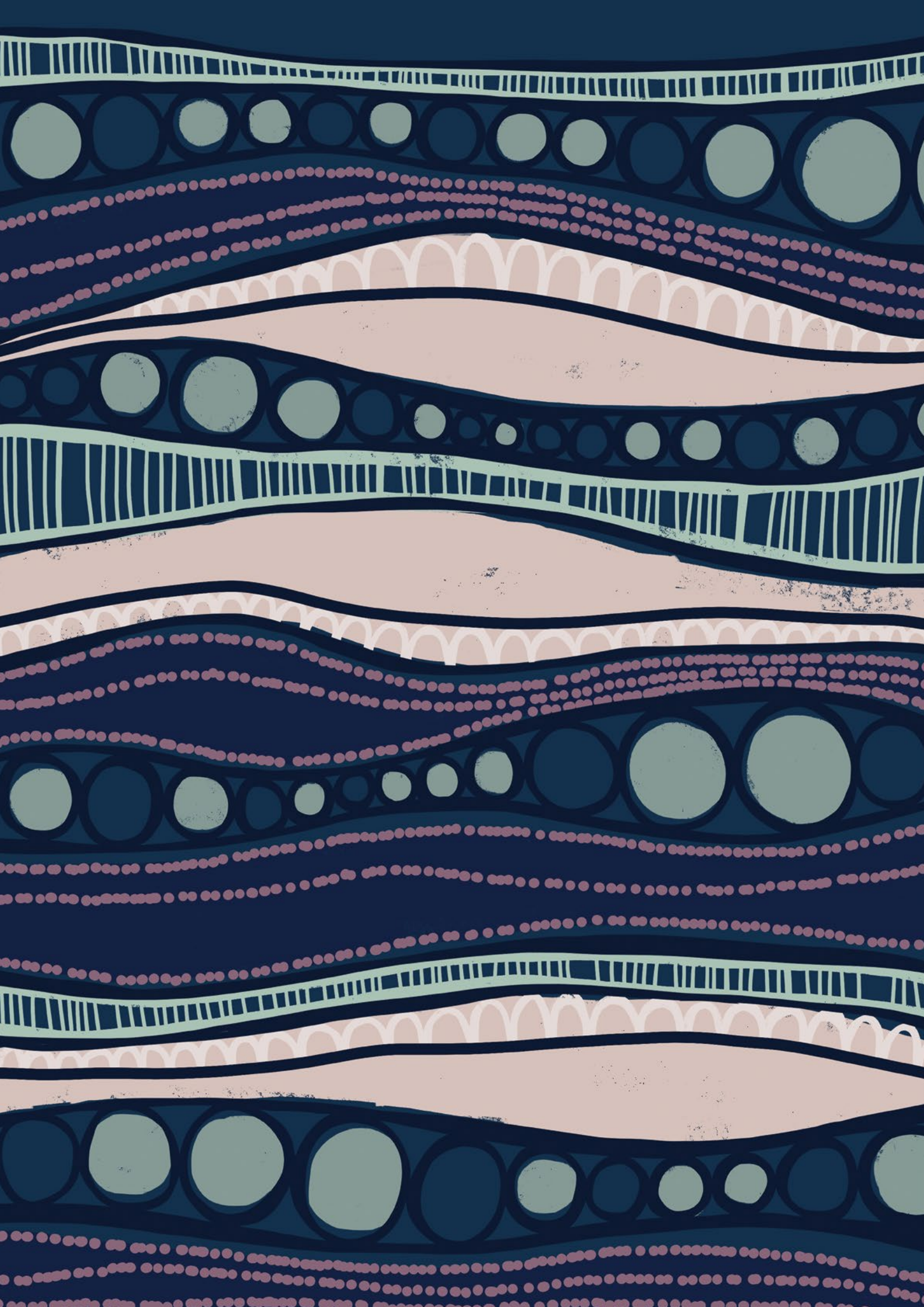
– Simon Marsland, National Environmental Science Program (NESP) Climate Systems Hub leader, CSIRO

Gudjugudju and Gavin thanked all the participants for being on their Country, the home of the Gimuy-Yidinji and Yirrgandji Peoples:

“

‘Wish you good spirits and safe travels back to your home Country. See you by-and-by, not good bye!’

– Gudjugudju and Gavin, Gimuy-Yidinji and Yirrgandji Traditional Owners (respectively)



Appendix A Agenda

Dates: 22–26 March 2021

Location: **Pullman Cairns International**, Queensland

Monday March 22, 2021 Day 1		
Time	Agenda	Who
Late afternoon	Delegates arrive	
5:30pm	Welcome to Country ceremony Wharf 3 – Cairns Wharf Complex <ul style="list-style-type: none"> Cultural protocols of host nation and responsibilities and protocols of guests and acknowledgement of their country 	Gudjugudju Gavin Singleton Djungan Djungan
Tuesday March 23, 2021 Day 2		
Time	Agenda	Who
9:00 – 10:30	Introduction	
Session One	<ul style="list-style-type: none"> Formal Welcomes, Handover Ceremony, overview of program etc. Presentation of statement from Barmah Minute silence in recognition of a difficult year Acknowledgement of Welcome Housekeeping 	Gudjugudju Gavin Singleton Desmond Morgan Sonia Cooper Co-facilitators
10:30 Morning break		
Session two	Traditional Owners Sharing climate change knowledge and experiences through timeline, supported by science of past sea-level changes, different ways about communicating	Bianca McNeair, Kathy McInnes, Julian O’Grady
Session three	Bringing ethics and climate science <ul style="list-style-type: none"> Present draft co-design consent process and code of conduct 	Co-chairs (Bianca McNeair, Damian Morgan-Bulled) and Host Community Working Group and Mandy Hopkins
Session four	Climate change literacy presentation including emissions as drivers of climate change	Djarra Delaney
1:00 Lunch		

Tuesday March 23, 2021 Day 2		
Time	Agenda	Who
2:00 Session five	Traditional Owners Sharing climate change knowledge and experiences six yarning themes based on different types of extremes <ol style="list-style-type: none"> 1. Marine heatwaves – Bianca McNeair with Neil Holbrook. 2. Heatwaves on land – Indigenous Desert Alliance with Jason Evans 3. Bushfires – Djarra Delaney with David Karoly 4. Extreme water events (dry/wet) – Damian Morgan-Bulled, Jason Wilson and Dewi Kirono, Christine Chung 5. Sea-level rise (storm surges, king tides) Hilda Mosby, Samarla Deshong, with Julian O’Grady, Kathy McInnes. 6. Cyclones – Djungan Neal and Samarla Deshong with Hamish Ramsay and Savin Chand 	
Afternoon tea 3:30pm		
4:00 Session six	Traditional Owners Sharing climate change knowledge and experiences (cont.) Panel discussion on the yarning themes	
5:30	Close day 1 <ul style="list-style-type: none"> • arrangements for field trips • what is happening the next day 	
Wednesday March 24 Day 3 (Cultural program: field activities)		
Time	Agenda	Who
All day	Cultural tours aligned to session	Host Community Working Group

Appendix A Agenda

Dates: 22–26 March 2021

Location: **Pullman Cairns International**, Queensland

Thursday March 25, 2021 Day 4		
Time	Agenda	Who
9:00	Acknowledgement of country	Bianca McNeair
Session one	Recap of previous days	Facilitator
	Working together for global change	Chaired by Damian Morgan-Bulled and Taha Cowen
	Utilising Indigenous Cultural Heritage to address a Changing Climate	James Rattling Leaf Jnr
	Conference of Parties (CoP) and Intergovernmental Panel on Climate Change	Taha Cowen
	United Nations Convention on Biological Diversity	Birrin Hooper
10:30 Morning break		
11:00	Tangible information that can be taken back to communities	Thematic sub-groups, led by SC members, each with a scientist
Session two	Six different yarning themes to co-produce between Traditional Owners and scientific information	
1:00 Lunch		
1:30	Tangible information that can be taken back to communities (cont.)	
Session three	Six different yarning themes to co-produce between Traditional Owners and scientific information	
2:30	Report back from yarning themes and presentation of tangible products	Dean Parkin
Afternoon tea 3:30pm		
4:00	Drafting the Gathering statement	Dean Parkin
5:00	Close day	
	<ul style="list-style-type: none"> Consent forms signed back 	
6:30 pm	Official dinner at Salthouse	

March 26 Friday | Day 5

Time	Agenda	Who
8:30	Taking the momentum forward <ul style="list-style-type: none">• Presenting the final statement• Identifying options for policy solutions• Evaluation	
10:30	Meeting close, people go home	

Appendix B Steering Committee and Co-design Principles

Steering Committee Members

Member	Endorsed by	State/territory
Samarla Deshong	Konjimal People and the Traditional Owners Reference Groups (seven First Nations)	Qld
Djungan Neal	Djungan PBC people and also liaising with related groups Gurubana Gunnganjhi	Qld
Kelvin Flugge	Ngoonar Land Enterprises (cooperative of 10 groups)	WA (part only, had to withdraw)
Jason Wilson	Yauwaalaraay/Euahlayi People (Native Title group)	NSW and south-west Qld
Bianca McNeair	Malgana Aboriginal Corporation RNTBC	WA
Damien Morgan-Bulled	Yorta Yorta Nation Aboriginal Corporation	Vic and southern NSW
Jamie Graham	Tasmanian Aboriginal Corporation	Lutruwita (Tasmania) (part only, had to withdraw)
Hilda Mosby	Torres Strait Regional Authority (Board member elected by the people; TSRA is also the NTRB.)	Torres Strait
Josh Gilbert	First Peoples delegate from ESCC Hub Steering Committee	NSW
Djarra Delaney	First Peoples delegate for Bureau of Meteorology	Vic

Our Co-design Principles⁵

- First Peoples-led
- Understanding that there are many peoples, many cultures.
- Including Traditional Owners from the start (and all the way through).
- Building (and being prepared to maintain) trusted relationships.
- Appreciating different timelines.
- Ensuring free, prior and informed consent.
- Respecting the provision and ownership of traditional knowledge and Indigenous Cultural and Intellectual Property (ICIP).
- Identifying benefits to Country and community.
- Ensuring that we are giving as well as taking.
- Remembering that connection to Country is forever
- Reflective learning.

First Peoples-led

We will ensure First Peoples standards and controls, leadership, ownership, power balance, integrity, authority with gate checking, agency, autonomy, decision making, responsibility, voice and visible presence across resources, ideas and benefits.

Understanding that there are many peoples, many cultures

Australia's First Nations people comprise many hundreds of nation groups, each with their own culture, protocols, knowledge and connections. It is important to ensure that the Traditional Owners that we are engaging with are the right ones to talk to about the country, community or culture of interest. This is not only in consideration of nation group, but also within that group who the appropriate person or people to speak to are. Elders are recognised custodians of traditional knowledge and protocols and should always be consulted.

Including Traditional Owners from the start (and all the way through)

Where our National Gathering project affects Aboriginal interests on Country, Traditional Owners will be contacted and involved as early in planning and developing the project as possible. This involvement will not be tokenistic and will include Traditional Owners in a meaningful and respectful way. Quite rightly, Traditional Owners want to have input to and be kept up to date on work that affects them and their Country. This could be as simple as making time for regular meetings or providing regular updates, but in all cases, it will meet the needs of the Traditional Owners as well as other participants.

Building (and being prepared to maintain) trusted relationships

Long before our National Gathering project work starts, it is important that everyone gets to know, respect and trust each other. Trusted relationships cannot be forced but have to develop over time. Trusted relationships also extend over time – a one-off engagement is not a 'relationship'. This interpersonal dimension is not generally factored into research projects but is an essential component of working with Traditional Owners. In this context, as in life generally, building relationships can be complicated and requires considerable effort. Relationships also do not generally follow timelines and frameworks, unlike other aspects of projects.

Appreciating different timelines

Building and maintaining trusted relationships takes time, as does setting up common ground for our activities. This almost never aligns with project and funding schedules. Once the project is up and running, deadlines that are important in the project context have little meaning outside of it. Schedules need to be flexible to accommodate time required for protocols and practices outside of the project.

⁵ Adapted from: Pearce, K., Bullio, R., Morgan-Bulled, D., McNeair, B., Flugge, K., Mosby, H., . . . Hopkins, M. (2020). Considerations for co-design. Collaborating with First Nations peoples on climate change. *Bulletin of the Australian Meteorological & Oceanographic Society*, 33(3), 18-19. AND CSIRO Indigenous Science Program with Independent Indigenous Reference Group and CSIRO Reference Group. (2019). *Co-development Principles* CSIRO Internal report.

Appendix B Steering Committee and Co-design Principles

Ensuring free, prior and informed consent

Free, prior and informed consent is a fundamental principle recognised in the United Nations Declaration on the Rights of Indigenous Peoples, among other international legal instruments. It recognises that Indigenous peoples have the right to be part of any decision-making process that affects them or their Country, and that they can do so with no pressure or coercion (free), with sufficient time before decisions are made (prior), and with access to all available information (informed). Consent may be given, withheld or negotiated, and can be withdrawn at any time. A memorandum of understanding or partnership agreement is an excellent way to document the terms of free, prior and informed consent and engagement generally. It will ensure that everyone is aware of what to expect and what is expected of them from the start.

Respecting the provision and ownership of traditional knowledge and Indigenous Cultural and Intellectual Property (ICIP)

In the past, intellectual property of Traditional Owners has not been recognised, with traditional knowledge being freely given but not valued or acknowledged by western researchers. It is now understood that traditional knowledge is not a free resource, there for the taking. Just as western science researchers are paid, payment for services to provide traditional knowledge may also be required. This needs to be factored into project budgets. Similarly, just as western science researchers are appropriately acknowledged in research publications and products, so too should Indigenous collaborators. Remember many Traditional Owners have been through cycles of new researchers, same research – often with little to show for it. We will ensure we do our groundwork, so no-one's time is wasted.

Identifying benefits to Country and community

We will be clear about the benefits to Country and community of the National Gathering and be willing to work with Traditional Owners to deliver these. At a minimum, the benefits will include information resulting from our project (in a relevant, useful and accessible format); however other benefits are possible, including capacity building opportunities for Traditional Owners. If a project has no benefits to Country or community, it is not reasonable to expect cooperation and collaboration of the Traditional Owners. Like everyone, Traditional Owners have limited time and financial resources, and competing demands on both, so it should not come as a surprise if priority is given to projects with tangible returns for Country or community.

Ensuring we are giving as well as taking

We will use principles of reciprocity and respect and follow cultural protocols throughout the project. We will ensure Traditional Owners are informed and updated and at its conclusion, ensure research outputs come back – at the very least copies of papers and reports. Meetings, tailored communication products and ongoing contact are also appropriate. We will use Indigenous research methodologies such as yarning.

Remembering that connection to Country is forever

Research programs and projects come and go, but the connection of First Nations people to Country does not end. We will be mindful that our legacy, good or bad, will stay with the Traditional Owners we have worked with after we move on and so conduct ourselves, personally and professionally, accordingly.

Reflective learning

We will evaluate whether co-design is happening successfully. We will adapt, be genuinely reflective and learn lessons along the way. We value best practice, two-way teaching and learning and living with uncertainty.

Appendix C Location of attendee First Peoples' groups and organisations



Appendix D Attendees

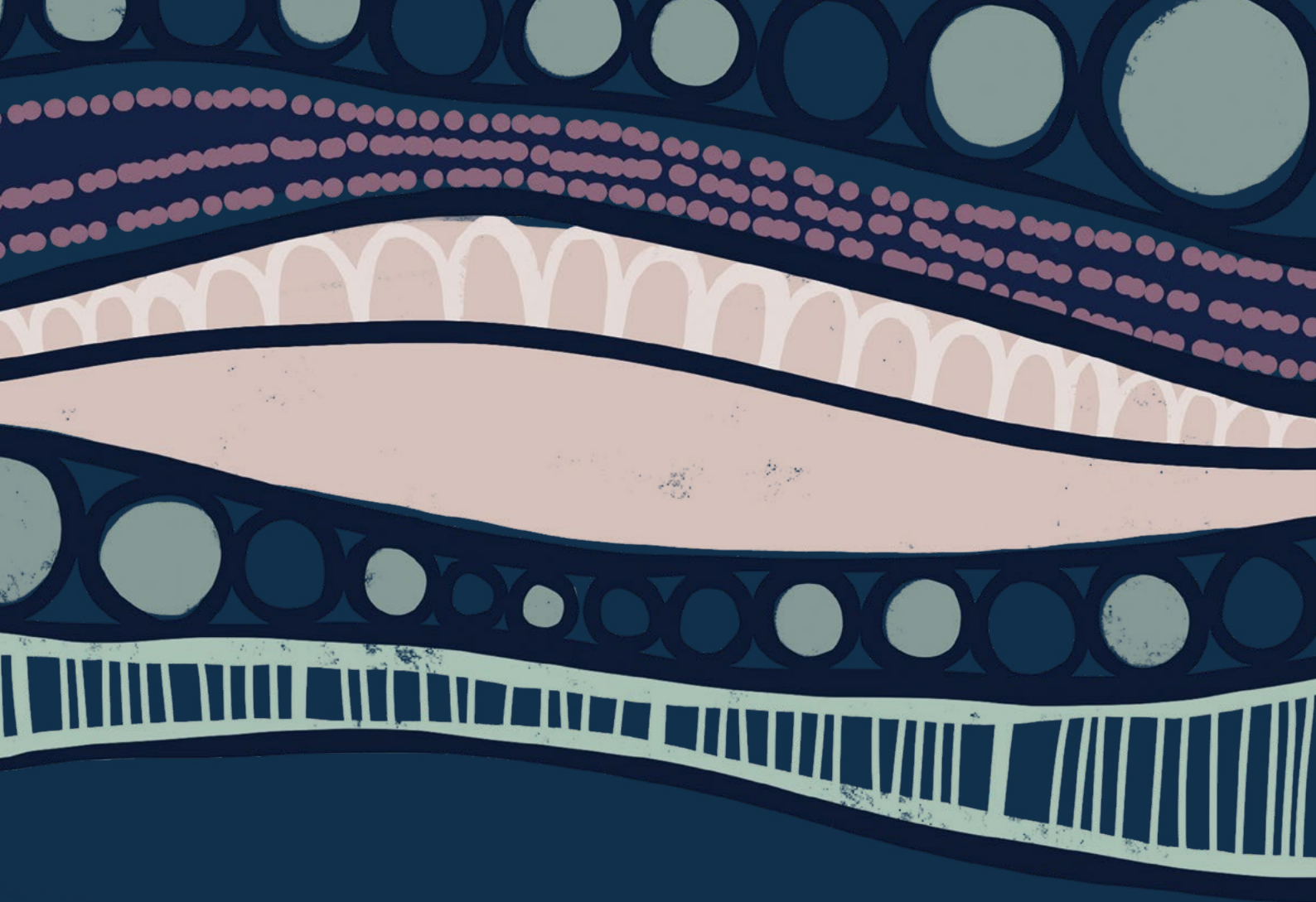
First name	Surname	State	Organisation/ Country
Brian	Austral	NT	Tiwi Islands
Larissa	Baldwin	QLD	Widjabul Wia-bul
Natasha	Bell	QLD	Western Yalanji PBC
Peter	Bligh		AIATSIS
Sharon	Bonython-Ericson	QLD	Yidinji
Chiveree	Bradley	QLD	Western Yalanji PBC
Sharon	Brandy	QLD	Western Yalanji PBC
Rowie	Bullio	QLD	ESCC Hub
Laura	Butler	TAS	Melukerdee
Pep	Canadell	ACT	ESCC Hub
Moni	Carlise	QLD	On behalf of Torres Strait Regional Authority
Merle	Carter	WA	Mirriuwung Gajerrong
Gareth	Catt	WA	10 Deserts Project and Indigenous Desert Alliance
Savin	Chand	VIC	ESCC Hub
Christine	Chung	VIC	ESCC Hub
Shannon	Clohessy	WA	Wadandi
Rangi	Clubb	QLD	Gambir Yidinji
Thomas	Clubb	QLD	Gambir Yidinji
Sonia	Cooper	VIC	Yorta Yorta Nation Aboriginal Corporation
Jeanette	Corbitt	ACT	Department of Water, Agriculture and the Environment
Taha	Cowen	Tas	Melukerdee
Djarra	Delaney	VIC	Quandamooka
Samarla	Deshong	QLD	Konjimal People and the Traditional Owners Reference Group (7 First Peoples)
Jason	Evans	NSW	ESCC Hub
Amanda	Ewart	QLD	Ipima Ikaya Aboriginal Corp RNTBC
Kathy	Eyles	ACT	Department of Water, Agriculture and the Environment
Nicholas	Fitzpatrick	NT	Yanyuwa and Garawa
Kelvin	Flugge	WA	Wudjari country
Gudjugudju	Fourmile	QLD	Gimuy Walubara Yidinji

First name	Surname	State	Organisation/ Country
Jiritju	Fourmile	QLD	Gimuy Walubara Yidinji
Jenny	Fraser	QLD	
Duane	Fraser	QLD	Wulgurukaba
Danny	Gardner	TAS	Pakana
Krition	Glenn	ACT	Geoscience Australia
Jade	Gould	QLD	Butchulla
Lucy	Graham	QLD	CSIRO volunteer
Jonathon	Green	SA	Indigenous Land and Sea Corporation
Carol	Hapke	WA	Mirriuwung Gajerrong
Ro	Hill	QLD	CSIRO
Neil	Holbrook	Tas	ESCC Hub
Birrin	Hooper	ACT	Bundjalung
Mandy	Hopkins	VIC	ESCC Hub
Zane	Hughes	WA	Waanyi
Barry	Hunter	QLD	Djabugay
Cass	Hunter	QLD	Kuku Yalanji and Maluiligal
Guy	Jackson	QLD	CSIRO volunteer
Dan	Joesph	QLD	Gambir Yidinji
Charlie	Kaddy	QLD	Gur A Baradharaw Kod Torres Strait Sea and Land Council
David	Karoly	VIC	ESCC Hub
Mavis	Kerinaiaua	NT	Tiwi Islands
Judith	Ketchell	QLD	
Tishiko	King	VIC	Zenadth Kes/ Torres Strait Islander – Masig (Mosby) and Badu (Ahmat)
Dewi	Kirono	VIC	ESCC Hub
Learna	Langworthy	TAS	Melukerdee
Marceil	Lawrence	Cairns	Western Yalanji PBC, Kali PBC, Lake Eyre PBC
Levi	Lee		Biripi/ AIATSIS
John	Locke	QLD	Rainforest Aboriginal Peoples Strategic Custodial Think Tank
Chris	Long	NT	Tiwi Islands

Appendix D Attendees

First name	Surname	State	Organisation/ Country
Helena	Longcaric	Cairns	Western Yalanji PBC
Pauline	Longcaric	Cairns	Western Yalanji PBC
Harold	Ludwick	QLD	Bulgun Warra Guugu Yimidhirr
Pethie	Lyons	QLD	CSIRO
Waniki	Maluwapi	QLD	Malu Kiwai – Boigu Island of the Torres Strait Islands
Nathan	Mann	ACT	Ngarrindjeri
Rob	Markham	NT	Jawoyn
Simon	Marsland	VIC	ESCC Hub
Oral	McGuire	WA	Ballardong Noongar
Kathy	McInnes	VIC	ESCC Hub
Nykita	McNeair	WA	Malgana
Bianca	McNeair	WA	Malgana
Aaron	Morgan	VIC	Gunditj Mirring Traditional Owners Aboriginal Cooperation
Desmond	Morgan	VIC	Yorta Yorta Nation Aboriginal Corporation
Damian	Morgan-Bulled	VIC	Yorta Yorta Nation Aboriginal Corporation
Hilda	Mosby	QLD	Torres Strait Regional Authority
Shenade	Muller	ACT	Jirrbal and Kuku Yalanji
Alan	Mummery	NT	Larrakia
Peter	Murray	WA	Yanunijarra Aboriginal Corporation
Djungan Paul	Neal	QLD	Djungan PBC
Judulu	Neal	QLD	Djungan PBC
Mala	Neal	QLD	Djungan PBC
Julian	O'Grady	VIC	ESCC Hub
Rhys	Paddick	WA	Yamatji
Dean	Parkin	QLD	
Zarif	Raman	VIC	ESCC Hub
Hamish	Ramsay	VIC	ESCC Hub
James	Rattling Leaf Snr	South Dakota USA	Group on Earth Observations Indigenous Alliance

First name	Surname	State	Organisation/ Country
Erin	Rose	VIC	Gunditj Mirring Traditional Owners Aboriginal Cooperation
Sophie	Schmidt	Tas	ESCC Hub
Greg	Shelton	VIC	Gunditj Mirring Traditional Owners Aboriginal Cooperation
Marian	Sheppard	VIC	ESCC Hub
Wynston	Shovellor-Sesar	NSW	Karajarri
Gavin	Singleton	QLD	Yirrganydji
Tarquin	Singleton	QLD	Yirrganydji
Jason	Smith	TAS	Palawa
Lance	Syme	NSW	Wiradjuri
Aleana	Talbot	NT	Larrakia
Leah	Talbot	QLD	Kuku Yalanji
Kabay	Tamu	Torres Strait	Warraberalgal
Radayne	Tanna	QLD	Western Yalanji PBC
Sandi	Taylor	QLD	Kakadoon, Ngnwun and Yirendali
Amelia	Telford	VIC	Bundjalung (Minjungbal) and South Sea Islander
David	Thompson	QLD	Videographer
Julia	van Velden	QLD	CSIRO
Shilo	Villaflor	QLD	Aboriginal Carbon Foundation
Torres	Webb	QLD	CSIRO
Karl	Williams	QLD	Western Yalanji PBC
Glen	Wingfield	SA	Kakatma Aboriginal Corporation
Jeanon	Woosup	QLD	Bamaga
Liz	Wren	QLD	Wiradjuri



Earth Systems and
Climate Change
Hub

National Environmental Science Programme

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