

S02.2

Balancing water needs when water cycle is out of balance

Dr Margot Turner, Mr Michael Hammond, Mr Simon Rodgers, Mr Tim Storer
Department of Water and Environmental Regulation, Perth, Australia

Abstract

Western Australia's climate is changing. We are facing unprecedented impacts and management challenges for surface water and groundwater availability and demand, water quality, ecohydrology and integrated water and land use developments.

We need useful climate science to help make tough decisions about balancing competing needs. However, climate science is by nature uncertain, and factoring this into water assessments and then communicating our decisions to stakeholders, needs practitioners to be comfortable working with and communicating the climate change uncertainty.

The Department of Water and Environmental Regulation has developed a new way to incorporate climate science into our water management to ensure our water resources meet community needs, protect and build resilience in our ecosystems, and have sustainable development. Based on a framework developing storyline narratives that link climate drivers to water availability, it assesses how climate change will affect water availability in the future.

Moderated by Nicole Harvey, you will hear from experts in the Department of Water and Environmental Regulation and CSIRO about understanding the sensitivity of water resources to changes in climate and the challenges we face in adapting the water sector to a changing climate:

- Facilitator – Nicole Harvey – Climate Science Communicator
- Dr Margot Turner – Principal climate change and water specialist (hydroclimate)
- Michael Hammond – Principal water planner (water planning)
- Simon Rodgers – Manager Hydrology and Hydroclimate (extremes - flood)
- Tim Storer – Principal Scientific Officer (ecosystems)
- Steve Charles – Senior Research Scientist (hydroclimate)
- Adam Siade – Senior Research Scientist (groundwater modelling)

Funding Sources: The Government of Western Australia's Climate Adaptation Strategy (action 8)

Theme

Adaptation in practice

S02.3

Advancing Climate Change Risk Management Across Government Levels in Australia

Dr Tayanah O'Donnell¹, Ms Victoria Chantra², Dr Fahim Tonmoy³

¹Australian National University, Canberra, Australia. ²Deloitte, Melbourne, Australia. ³Deloitte, Brisbane, Australia

Abstract

Effective climate change risk management requires coordinated action across all levels of government. Australia is currently undertaking its first-ever National Climate Risk Assessment to provide a comprehensive understanding of climate-related threats at a national scale. Meanwhile, several states and territories, including South Australia, Tasmania, and the Northern Territory, have completed state-wide climate risk assessments, offering region-specific insights and strategies. Local governments, long at the forefront of climate adaptation, continue to implement practical responses that protect communities, infrastructure, and ecosystems.

In addition to climate risk assessments, national coordination efforts relating to disaster risk reduction and resilience are well progressed. The Colvin Review recently highlighted that the spend for risk reduction and resilience has increased from 3% of overall spend, to 13%, and we also see tangible outcomes being delivered for communities across the disaster continuum. There are, however, continued challenges.

This panel will bring together key representatives involved in these various efforts to discuss how different levels of government are approaching climate risk, adaptation, and resilience. The discussion will explore the methodologies used, emerging findings, and how these efforts are informing decision-making, policy development, and investment planning. Panellists will also examine the challenges of integrating risk assessments across scales and ensuring alignment between national, state, and local adaptation priorities.

Key themes for discussion include:

- The significance of Australia's National Climate Risk Assessment and how it informs broader adaptation planning.
- The Colvin Review findings and their relevance for scaled adaptation and resilience.
- Lessons from state-wide risk assessments, including methodologies, sectoral risks, and governance insights.
- The leadership role of local governments in adaptation and their ongoing challenges in implementation.
- Opportunities for greater collaboration between governments to enhance climate resilience.

This panel will be of interest to industry, practitioners, researchers, and government representatives seeking to enhance climate risk management and resilience outcomes in Australia.

Theme

Decisions & governance

S02.4

National Priorities need Local Solutions – Local Government in Climate Adaptation

Dr Eleanor Robson¹, Mr Kieran Power²

¹Australian Local Government Association, Canberra, Australia. ²Nation Partners, Melbourne, Australia



Dr Eleanor Robson



Mr Kieran Power

Abstract

Local governments are bearing the brunt of climate impacts. While the approaches of federal governments to climate change have been highly variable over the years, local governments have demonstrated consistent, place-based leadership in identifying and mitigating climate risks and seizing on opportunities. As the deep social, economic, environmental and cultural impacts of climate change manifest with greater frequency and severity, there is an urgent need to install a comprehensive national policy and funding effort for adaptation. As adaptation scholars and practitioners have explored, financing of local adaptation is a vexed issue globally (e.g. Moser et al. 2019; OECD 2023). In Australia, we have the opportunity to trial and learn about local adaptation funding options which can contribute to the global effort, through supporting our own local governments.

The Australian Local Government Association (ALGA) advocates that without a step-change in funding and a true multi-level governance approach, community outcomes will suffer while local governments will bear a highly inequitable burden of adaptation effort.

ALGA has produced Australian-first, local government sector-led research which provides deeper insight into the contribution of local governments to adaptation. It includes a comprehensive scan of local government adaptation efforts, leading to a novel typology that describes the levers available to councils when addressing different risks. It also includes economic analysis to understand the benefit-cost ratio of different adaptation interventions, and an assessment of the national benefit of providing our local governments with a consistent funding stream to support their adaptation efforts.

This panel will feature Dr Eleanor Robson (ALGA), Kieran Power (Nation Partners) and <WA MAYOR TBC>, who will discuss the novel findings and methodological approach, implications for how multi-level governance for adaptation can be put into action, and the new adaptation opportunities which open when a consistent funding and governance model is implemented.

Theme

Decisions & governance

S02.5

Overcoming barriers to enabling effective adaptation:

Dr Estefania Arteaga¹, Mr Donovan Burton², Dr Johanna Nalau³

¹World Adaptation Science Programme, Gold Coast, Australia. ²Informed.City, Brisbane, Australia. ³Griffith University, Gold Coast, Australia

Abstract

This co-creation session aims to facilitate an interactive and knowledge-sharing space for adaptation practitioners, researchers, and policymakers to critically assess barriers and enablers across the entire adaptation process—from planning to implementation. Understanding what went and what could go wrong in adaptation efforts and the barriers that need to be overcome is essential for measuring progress in adaptation. This session will help participants reflect on these challenges, contributing to a clearer understanding of how we advance in adaptation.

It will include three key short presentations, each setting the stage for interactive discussions and exercises:

1. Understanding the Framework and Real-World Application – this segment will introduce the framework developed in the published study Unpacking the theory-practice gap in climate adaptation and showcase its application in a real-world case study, demonstrating how barriers and enablers were identified and addressed.
2. Why Effective Adaptation is a Process – Donovan Burton will provide insights into why adaptation should be viewed as an ongoing, iterative process rather than a one-off action. He will discuss the evolving nature of climate risks, the need for continuous learning, and how practitioners can integrate flexibility and adaptive management into their work.
3. Adaptation Heuristics, Rationales, and Reporting – Johanna Nalau will lead a discussion on the different ways adaptation is framed and understood, and how these cognitive framings can act as barriers to effective action. The session will explore adaptation heuristics—mental shortcuts that influence how decisions are made—and how these can impact policy and practice.

Theme

Adaptation in practice

S03.2.1

Adaptation Planning with WA Primary Production

Ms Jackie Bucat¹, Dr David Bowran², Dr Meredith Guthrie¹

¹DPIRD, Perth, Australia. ²Yaruna Research, Northam, Australia



Ms Jackie Bucat



Dr Meredith Guthrie

Abstract

The Department of Primary Industries and Regional Development (DPIRD) is leading the development of the climate adaptation plan for the Primary production sector, encompassing the diverse industries of broadacre crops, livestock, horticulture, forestry, fisheries and aquaculture. This is part of the Sector Adaptation Plan Program of the Western Australian Government.

The primary aim of this project is to develop a government-endorsed plan that outlines the priority needs required for the primary production sector to respond to future climate challenges. However, the process itself holds equal importance. The approach is designed to enhance adaptation planning expertise among sector leaders and promote cohesion between government, private entities, and community participants.

This initiative is currently in progress. We report on the key process components and outcomes to date

1. Creating an enabling environment for industry leaders, decision makers and experts to share different views and perspectives and develop a shared path forward. Industry stakeholders work together in facilitated workshops to identify policies, program and measures to enhance the sectors capacity to adapt to the impacts of climate change. Empowering participants with a sense of agency, confidence, and ownership is critical for engagement and implementation of the plans.
2. Development of comprehensive climate projections, tailored for each industry. Stakeholders in the cropping industry need to know how much less rain during the growing season, horticulturalists need to know the change in chill portions, and livestock producers need the change in heat, to determine likely climate impacts.
3. Identification of key hazards. Stakeholders consider the most significant consequences of climate change for their crops and livestock, paddocks, businesses, or industries, forming a basis for developing solutions to the priority problems. Key hazards are sector specific, like increased heat causing fertility problems, and overarching, like increased fire risk, reduced liveability on the regions and water security.

Theme

Understanding & assessing hazards & risk

S03.2.2

Climate-Resilient Agricultural Planning: An Economic Decision-Support Model for Long-Term Adaptation

Mr Nicholas Thorsager, Ms Jackie Bucat, Mr Johnny Machon
DPIRD, Perth, Australia



Mr Nicholas Thorsager



Ms Jackie Bucat



Mr Johnny Machon

Abstract

Agricultural productivity faces unprecedented challenges from climate change, requiring strategic adaptation planning based on robust economic analysis. We present an innovative decision-support model that enables farmers to quantify economic outcomes under multiple climate scenarios from 2026-2050. The model synthesizes location-specific yield multipliers for wheat, canola, and barley with climate projections (RCP 4.5 and RCP 8.5), creating comprehensive economic assessments of adaptation options.

The model's methodological framework incorporates historical yield variability with projected climate impacts, generating yearly multipliers that reflect both seasonal fluctuations and long-term trends. This approach allows for sophisticated risk quantification, including drought impact assessment, yield safety margins, and return-on-investment analysis across different agricultural regions in Australia.

Key functionality includes break-even point determination for critical input parameters and calculation of required annual yield increases necessary to maintain profitability under worsening climate conditions. Comparative visualisation capabilities enable farmers to evaluate multiple adaptation strategies simultaneously, supporting evidence-based decision-making.

Testing demonstrates the model's versatility, allowing users to leverage trusted existing data or input personalized parameters. Inter-regional comparison functionality provides critical insights into relative climate resilience across locations, helping producers make informed long-term management decisions about crop selection, investments, and potential land-use changes.

By bridging the gap between complex climate projections and practical economic insights, this model addresses a critical need for adaptive planning in agricultural systems facing increasing climate uncertainty and variability. Most importantly, models with these capabilities translate complex climate science into communicable and actionable insights.

Theme

Tell it, talk it

S03.2.3

Leaping the climate projection uncertainty chasm with agricultural vulnerability maps.

Dr Jaclyn Brown¹, Dr David Gobbett², Dr Chao Chen³, Dr Andrew Fletcher³, Dr Zvi Hochman⁴, Dr John Clarke⁵

¹CSIRO, Hobart, Australia. ²Retired, Adelaide, Australia. ³CSIRO, Floreat, Australia. ⁴Retired, St Lucia, Australia. ⁵csiro, Aspendale, Australia



Dr Jaclyn Brown

Abstract

Technological advances and adaptation methods are already being implemented to combat the effects of climate change on reduced agricultural productivity. Further climate pressures are expected, and knowledge of these changes is critical to implement effective adaptation methods.

Top-down approaches where climate models are downscaled and used as input to production models are known to have limitations due to the compounding uncertainties and biases introduced from each modelling system. This can create a cascade of uncertainties and lead to a paralysis of action. Alternative approaches such as scenario-neutral or 'top-down, bottom-up' methods address this problem for simpler systems such as hydrology. In these assessments, the problem is inverted to ask what climate pressures would result in exceeding a vulnerability threshold and then look at the likelihood that they might occur. Here we test this approach for its applicability in agriculture in a case study of Australia's wheat production. This approach can be applied to a range of sectors beyond agriculture.

Our proposed method explores a range of climate perturbations applied to existing weather observations. A climate vulnerability map is developed that describes the change in yield for the range of climate perturbations tested. We then use climate projections to understand the most likely future and contrast changes to different climate variables and sensitivity at different locations. This method reduces some of the uncertainty, but not all, of a yield projection. It also provides a more intuitive tool to explore how climate affects yield.

Theme

Understanding & assessing hazards & risk

S03.2.4

Agriculture Adaptation: Effective program governance providing impact and investor confidence

Dr Neil Cliffe¹, Dr Jeff Coutts², Mr David Carey³, Mr Geoffrey Bahnisch³, Mr Grant Parker³

¹Department of Primary Industries Queensland, Mackay, Australia. ²Coutts J&R, Toowoomba, Australia. ³Department of Primary Industries Queensland, Emerald, Australia



Dr Neil Cliffe



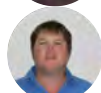
Dr Jeff Coutts



Mr David Carey



Mr Geoffrey Bahnisch



Mr Grant Parker

Abstract

Increasing frequency of extreme climate events is a major challenge for managing agriculture businesses in northern Australia. In 2016 Queensland Government established the Drought and Climate Adaptation Program (DCAP), to deliver collaborative research, development and adoption projects focussing on improving producer capacity to manage climate variability and adapt to climate change. Projects work closely with producers, ensuring project outcomes closely align to industry needs and priorities to develop and extend:

- New, more skilful rainfall forecasts for northern Australia,
- Heat stress forecasts to manage heat impacts in livestock,
- Critical temperature threshold parameters for horticulture crops,
- Pasture growth alerts for extensive grazing systems,
- A greenhouse gas emissions calculator for horticulture, and
- Producer skills to enhance climate risk adaptation outcomes through holistic business resilience planning.

Greater understanding and lessons have been learned about decisions and decision-making by producers about adapting to climate change impacts as a result of the program. In particular, providing producers with actionable adaptation intelligence, which is employed in tactical and strategic decision-making, is improving the adaptive capacity of agriculture to manage climate change impacts.

DCAP is underpinned by strong program governance, led by a multi-stakeholder Steering Committee, independent Technical Reference Panel

found that DCAP established itself as a flexible and well governed program and umbrella for overseeing, linking and managing a diverse range of projects. Further, Steering Committee members indicated that they are highly positive that DCAP projects are on-track to deliver and indeed exceed delivery of objectives and targets. Program impacts described to date indicate that significant benefits in terms of human capacity building, increased knowledge, development of tools and facilitation of practice change have occurred. DCAP provides valuable insights into best practice program governance which delivers coordinated and collaborative climate program and project delivery to the agriculture sector.

Theme

Decisions & governance

S03.2.5

Accelerated Resilience - Driving Collaboration for Rapid Agricultural Climate Adaptation

Dr Joanne Wisdom^{1,2}, Dr Mary-Anne Glanzlowe¹, Mrs Tanya Kilminster¹, Ms Lucy Tomassini¹, Mrs Rikki Foss¹

¹Grower Group Alliance, Perth, Australia. ²The University of Western Australia, Perth, Australia



Dr Joanne Wisdom



Dr Mary-Anne Glanzlowe



Mrs Tanya Kilminster



Ms Lucy Tomassini



Mrs Rikki Foss

Abstract

Agriculture must adapt to changing climates and climate shocks more rapidly than ever, necessitating innovative models to enhance resilience and sustainability. Government-funded 'Hubs' that embody the Triple Helix model—integrating academia, industry, and government—offer a promising framework for facilitating climate adaptation in agriculture. Such Hubs serve as collaborative platforms that leverage academic research, industrial innovation, and governmental engagement to build and disseminate information supporting climate-resilient agricultural practices.

International examples include India's National Innovations in Climate Resilient Agriculture initiative, which conducts research, demonstrates technologies, and builds capacities. Similarly, collaborations like the Agriculture Innovation Mission for Climate, led by the United States and the United Arab Emirates, have mobilised substantial investments to advance climate-smart agriculture through research and innovation.

The Australian Future Drought Fund (FDF) is a local example, bringing a consortium of partners together across eight Hubs to provide regionally focused information and support for developing, extending, and encouraging the adoption of drought-resilient technologies and practices.

This presentation will illustrate how the Hub model serves as a nexus for understanding farmers' challenges and linking opportunities to develop suitable solutions with seed funding. These partnerships catalyse high-risk projects more likely to deliver rapid solutions for climate adaptation in agriculture.

As a case study we will discuss how the South-West WA Drought Resilience Adoption and Innovation Hub targets innovative projects exploring new or modified systems to enhance agricultural climate resilience. These grants provide initial capital for projects outside traditional funding criteria, enabling development and attracting investment. Over 18 months, they advance knowledge, processes, or capabilities to drive long-term change.

FDF Hubs serve as a Triple Helix focal point, integrating diverse stakeholder perspectives to accelerate solution-building. This funding model could translate to the environmental sector, accelerating our ability to adapt to future climates.

Theme

Decisions & governance

S03.3.1

Lessons from a systems thinking approach in assessing climate risk

Mr Eric Lede¹, Ms Francine Machin², Dr Judith Landsberg²

¹Australian Climate Service, Canberra, Australia. ²Australian Climate Service, Melbourne, Australia

Abstract

This presentation reports on how the National Climate Risk Assessment applied a systems thinking approach to understand interconnected risks across Australia. This approach facilitated cross-pollination of content and insights among various teams, risks, and sectors, revealing novel insights into the interconnected nature of climate risks in Australia. Using a participatory method, 244 participants from diverse sectors and levels of government were engaged through eight workshops to identify how risks cascade and compound across systems. Systems spanned communities, the economy, health, and the natural environment among others. These workshops revealed over 300 impacts and opportunities that cascade across systems and scales, through several transmission pathways (e.g., finance, people, geopolitics). While this is far from a comprehensive stocktake of all cascading impacts, risks and opportunities across Australia, it highlighted the hyperconnected nature of our society, which must be accounted for in future risk assessments to better understand the complexity of climate risk profiles.

The applied approach revealed several key lessons. For example, risks that transfer between systems are triggered not only by hazards, but also by decisions. This underscores the importance of effective governance to support adaptation decision-making, enhancing positive outcomes and reducing maladaptation. In addition, this approach revealed that opportunities to adapt infrastructure offers strategic entry points to adapt multiple systems.

By understanding how climate risks proliferate through society and cross geographic and sectoral borders, we now have a better understanding of Australia's national risk profile and how to advance complex thinking in future risk assessments.

Theme

Understanding & assessing hazards & risk

S03.3.2

Integrating hazard, exposure and vulnerability data in a changing climate

Dr Lochlan Morrissey¹, Dr R. Matthew Beaty², Dr Joel Bertinshaw², Mr Ross Henry¹

¹Australian Climate Service, Canberra, Australia. ²Australian Bureau of Statistics, Melbourne, Australia

Abstract

Disaster risk to communities is understood as the interaction between the hazard, physical exposure and socioeconomic vulnerability to the hazard, and community adaptive capacity (IPCC 2022). This interaction is complex, and measuring disaster risk relies on designing and implementing a robust system of measurement.

These factors are combined to create an overall risk index, based on the RISK INFORM methodology created by the UNDRR (UNDRR 2020), which allows for the comparison and analysis of community risk nationally. Importantly, hazard and overall risk indices have been designed to facilitate comparison and show change across different global warming levels (GWLs). This presentation will give an overview of how this index has been used to measure climate risk to communities in the National Climate Risk Assessment. It will describe the creation of risk indices for bushfire, tropical cyclone, flood and heatwave that are based on physical modelling; physical exposure indices that describe the presence of important elements in communities; and socioeconomic vulnerability indices that use social and economic risk factors to estimate community vulnerability. The indices provide a detailed understanding of how community risks change under different GWLs and identify the factors contributing to a community's risk profile, allowing decision-makers to understand and target interventions effectively.

This presentation will discuss the conceptual design of the indices, challenges arising in their development, opportunities for future improvement, and some high-level findings from the Risk Assessment.

Intergovernmental Panel on Climate Change. (2022). Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press. <https://doi.org/10.1017/9781009325844>

United Nations Office for Disaster Risk Reduction (UNDRR). (2020). INFORM Risk Index: Methodology. <https://www.inform-index.org/Methodology>

Theme

Understanding & assessing hazards & risk

S03.3.3

Tasmania's Risk Assessment for Climate Change 2024

Dr Sarah Russell, Ms Nikki Krushka, Ms Isabelle Hawton

Renewables, Climate and Future Industries Tasmania, Hobart, Australia

Abstract

The Tasmanian Government released its first statewide climate change risk assessment in 2024. Developed by Deloitte Pty Ltd in partnership with the Tasmanian Government's Climate Change Office, the Risk Assessment considers:

- physical climate-related risks and opportunities, including:
 - climate-related acute shocks, such as heatwaves, floods, bushfires, drought, coastal erosion
 - longer-term climate trends, such as temperature change, sea level rise, seasonal distribution and intensity of rainfall, incidence of frost
- climate-related transition risks and opportunities, which are driven by policy, regulation, technology development, reputation, and market shifts, due to goals to reduce greenhouse gas emissions
- complex risks, including compounding, cascading and aggregate impacts – the multi-directional interactions between individual risks and opportunities.

The Risk Assessment is the first jurisdiction-wide climate change risk assessment in Australia to include both physical and transition risks. It explores climate change-related risks and opportunities using the IPCC recognised framework for climate risk, that includes an exploration of hazard, vulnerability, exposure and response. Risks and opportunities are categorised across four domains – natural, social, built and economic.

Forty priority risks and opportunities are presented in the Risk Assessment, each with an adaptation urgency rating from Tier 1 'Ready to Act' to Tier 4 'Monitor'.

Thirty-three risks and opportunities were identified as tier 1 and 2– meaning they require action in the next five years. The assessment of complex risks and links between risks and opportunities is reflected in each of the risk and opportunity impact profiles.

The Tasmanian Government has also developed a response to the Risk Assessment *Managing Tasmania's Climate Risks and Opportunities*, which sets out a range of climate adaptation actions.

The Tasmanian Government's Climate Change Office will present the findings of Tasmania's Risk Assessment for Climate Change 2024, and the challenges and learnings from that process, including in assessing complex risks.

Theme

Understanding & assessing hazards & risk

S03.3.4

Integrating climate resilience for Growth Areas North & West of Geelong

Mr Robert Turk¹, Mr Sean Keown², Mr Rhys Bennett², Ms Julia Stanley², Ms Charlotte Webster¹

¹Nation Partners, Melbourne, Australia. ²Barwon Water, Geelong, Australia



Mr Robert Turk



Mr Sean Keown



Mr Rhys Bennett



Ms Julia Stanley



Ms Charlotte Webster

Abstract

Growth Areas North and West of Geelong (GANWG) is a proposed greenfield development that will deliver an additional 40,000 lots to meet the needs of Geelong's rapidly expanding population. Currently, Barwon Water has minimal infrastructure in these areas, and initial estimates indicate \$2 Billion of water infrastructure is required over the next 40 years to provide necessary potable and recycled water and sewage capacity.

Recognising the increasing frequency, intensity and severity of climate-driven events, and that the greatest ability to influence climate resilience is the early infrastructure planning stages, Barwon Water engaged Nation Partners to assess the exposure and vulnerability of the proposed infrastructure assets to climate change to meet future service delivery and continuity requirements under a changing climate.

This project applied a mixed methods approach to assessing the exposure and vulnerability and drew from an initial study that assessed the climate exposure and vulnerability of six existing Barwon Water assets. To set boundaries of the assessment, 20 proposed assets of highest criticality to the future service provision were identified. A review was then undertaken of early planning documents and the GANWG concept design to understand the extent of climate change consideration. Following the interdependencies and upstream dependencies within and between the twenty priority assets in the GANWG were assessed.

For each asset, exposure to different climate variables was assessed under emission scenarios, RCP4.5 and RCP8.5 for 2050 and 2090. This included undertaking GIS spatial analysis to visualise the extent of overlap between proposed asset locations and climate hazards. The climate hazard vulnerabilities of each asset were assessed in workshops with relevant Barwon Water staff. In each workshop, participants considered the impact of the hazard on asset characteristics and asset interdependencies. Potential resilience measures were then identified through adaptation principles to guide further design stages and for individual assets.

Theme

Cities, settlements & infrastructure

S03.3.5

Swan River Hazard Assessment

Dr Matt Eliot

Seashore Engineering, Perth, Australia



Dr Matt Eliot

Abstract

Understanding erosion and inundation hazard is essential for foreshore planning and management in the context of a changing climate.

Within the Swan River, management decisions have often been based on the mistaken assumption that microtidal conditions and limited flooding result in stable morphology. This perception has been exacerbated by presence of ancient features and persistence of historic works. However, like all estuaries, the Swan River morphology is dynamic, responding to changing conditions and human activities, with response sometimes occurring over decades after change. Understanding the nature and pathway of these responses is crucial to our future decision-making, particularly in response to predicted tidal and sea level changes.

Parts of the river and estuary have responded in different ways. Identifying dynamic behaviour and connectivity through the lower Swan River has involved unpicking responses to significant structural changes to the river system, and distinguishing these from drastic historic climate fluctuation, which has seen negligible flooding for over 40 years. Hydraulic changes, including extensive dredging in two parts of the river, have modified tidal propagation through the river, creating pressure-points of channel expansion. In counterpoint, areas of foreshore reclamation have experienced the most severe erosion problems.

Projection of future hazard, including effects of sea level rise and occurrence of flood events, has been undertaken. This suggests a transition in management focus, from areas responding to previous foreshore alterations, toward emerging problems associated with response to climate change.

Theme

Understanding & assessing hazards & risk

S03.4.1

Advancing Climate Risk Management in Healthcare: Case Study from Brisbane

Dr Fahim Tonmoy^{1,2}, Ms Kellie Williams³, Ms Victoria Chantra¹, Ms Luisa Voogt¹, Mr Max Court¹

¹Deloitte, Brisbane, Australia. ²Griffith University, Gold Coast, Australia. ³Metro North Hospital and Health Service, Brisbane, Australia



Dr Fahim Tonmoy

Abstract

Climate change poses significant risks to healthcare infrastructure, operations, and service delivery. In response, Queensland Health has developed a climate change strategy and guidelines following the Queensland Government's 2018 Climate Adaptation Plan for the Health and Wellbeing Sector. Building on this, our project undertakes a comprehensive climate risk assessment and adaptation roadmap for a major hospital and health service (HHS) in Brisbane, serving over 900,000 people. To our knowledge, this initiative represents one of the first detailed climate risk management efforts for a hospital service in Australia.

The three-year project follows an iterative risk assessment approach. A first-pass (scan cycle) risk assessment identified high-level climate risks across multiple hospital campuses, including vulnerabilities in infrastructure (HVAC, power, water, IT), operations (clinical services, emergency medicine, supply chains), and workforce capacity. The next phase—a detailed cycle assessment—will analyse specific hospital buildings, critical services, and operational dependencies to inform targeted adaptation strategies.

This project integrates climate risk considerations into hospital service planning and management, fostering long-term resilience. Findings will guide infrastructure upgrades, operational adjustments, and workforce preparedness strategies. Additionally, the project offers a replicable framework for climate risk assessment in healthcare settings across Australia.

This paper outlines the methodology, key findings from the first-pass assessment, and the approach for the detailed cycle. We discuss lessons learned, challenges, and opportunities for scaling climate resilience in the health sector. By embedding climate risk management in healthcare, this study contributes to safeguarding essential health services in an uncertain climate future.

Theme

Cities, settlements & infrastructure

S03.4.2

Climate and communicable disease in Australia

Mr Greg Williams
CSIRO, Melbourne, Australia



Mr Greg Williams

Abstract

Climate and communicable diseases in Australia

Climate adaptation 2025: Abstract submission

Key words: communicable disease, human health, risk planning

Theme: Understanding & assessing hazards & risk

Author: Greg Williams, Health and Biosecurity lead at CSIRO Futures, CSIRO.

Abstract

Rising temperatures, changing rainfall patterns, and extreme weather events are driving a shift in the types and geographic spread, and pathogen survival of communicable diseases around Australia. These changes will have a significant impact on individual health, public health and health systems. However, very little analysis exists that wholistically examines the future communicable disease landscape in Australia, or the impact of climate on those risks.

To address this need, CSIRO Futures and the Australian Climate Service have developed an Australian-first discussion paper that examines the impact of climate change on communicable diseases in Australia. Key findings include:

- By 2050, climate change is expected to worsen the incidence and severity of most communicable diseases in Australia, with mosquito-borne diseases being the most sensitive to changes in the climate.
- A novel framework for risk identification was developed and applied to 93 communicable diseases. This saw avian influenza, dengue, Japanese encephalitis, melioidosis and salmonellosis rated moderate or high across most of the risk criteria applied.
- The most commonly raised area for further investment related to monitoring, detection and surveillance systems, including Early Warning Systems for communicable diseases and the need for a national vulnerability, capacity and adaptation assessment focused on climate and health linkages.

Theme

Understanding & assessing hazards & risk

S03.4.3

Evaluating the 35°C wet-bulb temperature threshold model of human survivability

Dr. Jem Cheng, Mr. Lee Jin, Mr. Jake McCahon, Prof. Ollie Jay
University of Sydney, Camperdown, Australia



Dr. Jem Cheng



Mr. Lee Jin



Mr. Jake McCahon



Prof. Ollie Jay

Abstract

Climatologists currently estimate that the environmental threshold for human heat tolerance is 6 hours at a wet-bulb temperature (T_{wet}) of 35 °C (Sherwood & Huber (2010) *PNAS*). When accounting for human thermoregulatory variables such as sweating capacity, this threshold may be underestimated. It is likely that the limits to human heat tolerance are not represented by a universal T_{wet} threshold but rather differ based on the type of heat stress an individual is exposed to (i.e., humid vs. dry). This theory has only ever been modelled (Vanos *et. al.* (2023) *Nat Commun*) but never tested in human subjects. The purpose of this study was to determine the physiological heat strain of human participants at different combinations of temperature and humidity yielding a fixed T_{wet} of 35 °C. We hypothesized that physiological heat strain would be greater at higher ambient temperatures despite this fixed T_{wet} . Twenty-six young, healthy recreationally active adults (12M/14F) completed 3 x 3-hour seated exposures in a climate chamber set to either 38 °C and 81.1% relative humidity (RH) (38/81), 46 °C and 45.8% RH (46/46), or 54 °C and 26.2% RH (54/26). Core temperature (T_{rec}) was measured continuously throughout each trial. Total exposure time required to reach an increased risk of heat exhaustion (39 °C), heat stroke (40 °C), and heat-related death (41 °C) was calculated by extrapolating T_{rec} based on the rate of change in the final 60 minutes of each trial. T_{rec} rate of change increased progressively from 38/81 to 46/46 to 54/26 (0.39 ± 0.11 vs. 0.62 ± 0.15 vs. 0.75 ± 0.24 °C/h, $p < 0.01$ for all comparisons) leading to shorter projected times to all critical temperatures with increasing ambient temperature. For a fixed T_{wet} of 35 °C, human physiological heat strain is greater and projected heat-related health impact exposure times are shorter with increasing ambient temperature.

Theme

Understanding & assessing hazards & risk

S03.4.4

Primary healthcare access in the face of climate change

Ms Darcy Glenn, Dr. Tom Logan
University of Canterbury, Christchurch, New Zealand

Abstract

We are currently facing a global physician shortage, and climate change could make healthcare access worse. Despite this, a global review of cities' climate risk reports reveals that, while there are widespread health concerns, cities are not considering climate impacts on primary healthcare. This is particularly critical when the system is already strained due to the existing physician shortage. Additionally, the provision of services such as these is already well known to be a driving factor of community cohesion and trust in institutions. We offer a way for cities to include measured and mapped changes in primary healthcare access allowing risk reports to become more actionable.

To model primary healthcare access, we matched patients with their preferred doctors. The model can also capture systemic barriers responsible for socioeconomic disparities in reported access. With this access model in place, we then tested the system with different scenarios: sea level rise or a spike in migration. We explored how residents' access healthcare could be affected, whether they have access at all, and who in our society carries the burden of this impact.

We have demonstrated an adaptive method to quantify and map the changes in primary healthcare access in New Zealand under multiple climate impacts. By altering preferences and climate hazards to local conditions, our model can make climate risk reports more actionable for protecting and improving healthcare access in our communities. Our model can be applied quickly, allowing governments to understand and quantify spatial inequalities in primary healthcare access under future climate change scenarios. By including this model's outputs in climate risk reports, public health departments will have a better picture of where additional resources should be focused to adapt.

Theme

Understanding & assessing hazards & risk

S03.4.5

Systematic literature review: Impacts of climate change on childhood obesity

Ms Mingxin Guo¹, Professor Li Ming Wen¹, Professor Mu Li¹, Professor Hong Jiang², Professor Haidong Kan², Professor Gengsheng He², Dr Penny Farrell¹, Professor Ying Zhang¹

¹University of Sydney, Sydney, Australia. ²Fudan University, Shanghai, China



Ms Mingxin Guo

Abstract

The intersection of climate change and childhood obesity is an emerging public health concern. The 2019 *Lancet* Commission introduced the concept of a "syndemic," highlighting the interconnections between malnutrition, obesity, and climate change. However, evidence on how climate-related factors influence childhood obesity remains limited and fragmented. This study presents an updated systematic review synthesizing literature published from 2019 to 2024 on the impacts of climate change on childhood obesity. Searches were conducted across four English databases (MEDLINE, Embase, Scopus, and CINAHL) and four Chinese databases (CNKI, Wanfang, CQVIP, and SinoMed). The review included studies that examined climate variables and obesity-related outcomes in children aged 2-12 years. Among 3,007 records screened, 16 studies met the inclusion criteria. The findings suggest that climate-related factors, including natural disasters, rainy and wet seasons, longer daylight hours, extreme cold and rising temperatures, may be associated with increased risks of childhood overweight and obesity. However, the results remain inconsistent, varying across genders and locations. Understanding how climate change exacerbates childhood obesity risks is crucial for developing effective adaptation strategies and public health interventions. A more integrated framework is needed for future research to better understand the underlying mechanisms to reduce childhood obesity in the context of climate change.

Theme

Understanding & assessing hazards & risk

S03.5.1

A Framework for Delivering End-User Driven Priority Climate Change Research

Mr Hayden Martin, Mr Simon Parsons, Ms Heidi Evans, Ms Lisa Chang, Mr Matthew Adams, Ms Jocelyn Dela-Cruz
Department of Climate Change, Energy, the Environment & Water, NSW, Australia



Mr Hayden Martin



Mr Simon Parsons

Abstract

Our communities, built assets, and natural ecosystems are under stress from the increasing impacts of climate change. We need to understand the risks and adapt. Impacts can be greatly reduced with adequate knowledge and sound decisions. Therefore, actionable climate information is urgently needed for adaptation decision making. However, research to practice and useability gaps are key causes in delays of information and data. Knowledge brokers can reduce the research to practice gap by connecting end users with the best available science and working with researchers to shape science to meet end user's needs.

Knowledge brokering plays a critical role in developing relationships and facilitating the exchange of knowledge between stakeholders. To support the delivery of end user driven research to address Climate Adaptation and risk assessments we have established a Climate Change Research Framework (CCRF). The CCRF outlines a process for best practice around how we co-design and deliver end-user driven research. The CCRF follows a 5-step cyclical process to ensure that the research is being continuously delivered and meets end user needs, this includes:

1. Knowledge Brokering and Expert Advice
2. Assess and Index Knowledge Base
3. Identify and Prioritise Knowledge Gaps
4. Interdisciplinary Research
5. Communicate and Integrate Findings

The CCRF is designed to support engagement between researchers and end-users to ensure that we are addressing on priority climate change risks, opportunities, and adaptation options. As part of the CCRF, a public facing dashboard has been developed, it captures both priority knowledge gaps, that have been identified through end user engagement, and climate change adaptation research that has been delivered through the program. By promoting our knowledge gaps this will aim to increase both transparency and help build relationships with research partners.... Refer to attached files for the remainder of the abstract

Theme

Decisions & governance

S03.5.2

Adaptation pathways to support regional climate resilient development in Australia

Dr Russell Wise¹, Mr Paul Box², Ms Sarah Tasic³, Mr Peter Heinmiller⁴, Dr Seona Meharg¹, MR David Haron⁵, Ms Peta Collins⁶

¹CSIRO, Canberra, Australia. ²CSIRO, Sydney, Australia. ³NSW Reconstruction Authority, Sydney, Australia. ⁴Value Advisory Partners, Melbourne, Australia. ⁵NSW Department of Planning, Sydney, Australia. ⁶Self employed, Sydney, Australia



Dr Russell Wise

Abstract

The intersection of climate change and development brings with it an inherently and irreducibly uncertain future. Recent experiences, and the prospects of further disruption from climate change, along with significant development needs and challenges, make the stakes associated with strategic planning and investment decisions high. Such contexts require decision makers adopt robust approaches to decision making. Adaptation pathways (AP) or climate resilient development pathways (CRDP) have been demonstrated in a range of settings to effectively meet these needs. Yet, as the world heads towards >2°C warming, more transformative responses (e.g., coastal retreat, disaster-prone community relocation, or ecosystem transformation) are needed. These options, however, are often not legal, legitimate or credible due to the prevailing systems of values, rules and knowledge governing organisational decision-making processes, which tend to constrain decision makers to business as usual. In this talk, I present a novel application of CRDP in strategic regional land-use planning in Australia, developed to support the multiple objectives of delivering safe and affordable housing, enabling infrastructure, and transformative adaptation interventions across the large heterogeneous coastal region of the Illawarra Shoalhaven. The talk will cover aspects such as: the multi-level, inclusive, and participatory processes adopted to consider legitimately-contested values of stakeholders; how deficits in understanding and data (particularly compounding hazards) were handled using hybrid qualitative-quantitative narrative scenarios; the development of a typology of location types based on spatial patterns of landform, settlement size, and proximity to critical services as the basis for scaling; and how housing policy options were identified and assessed against uncertain hazard levels and different stakeholders' risk tolerance levels to identify 'low regrets' pathways for housing delivery. Lessons from trying to embed a CRDP approach into strategic planning processes – using decision triggers, performance thresholds, and tipping points – and potential implications for governance, investments, and CRDP will be discussed.

Theme

Decisions & governance

S03.5.3

Alpine resorts tackling the nexus of physical and transition risk

Mr Kieran Power

Nation Partners, Melbourne, Australia

Abstract

Alpine Resorts Victoria (ARV) is a statutory authority established to oversee strategic leadership to the management of Victoria's six alpine resorts. Since early 2024, Nation Partners has been supporting ARV to develop an action-oriented climate adaptation strategy and framework to guide ARV's future decision-making, including integration of the Resist-Accept-Direct (RAD) framework to support place-based decisions.

To our knowledge, this project was the first application of the RAD framework in a context that actively considered the economic development implications of different adaptation options and what this could mean for tourism-dependent communities. This presentation will tell the story of adaptation in a highly challenging context, with transferrable lessons for delegates with interest in the fields land management, tourism, alpine ecosystems, and community resilience.

Key project findings:

- While it has been argued that resorts should pursue a shift to more 'green season' activities such as mountain biking, the revenue generated by these activities is not comparable, and in the Australian context the increasing risk of bushfire makes large-scale summer tourism challenging in highly forested and remote areas.
- At ARV's resorts, improved snowmaking and snow management practices have helped to weaken the relationship between natural snow depth and visitation numbers.
- Alpine resorts sit at a challenging nexus of physical and transition risk. Further investment in snowmaking can partially address the physical risks arising from lower average snowfall, but uncertainty about the future cost and emissions intensity of energy create uncertainty around the viability of such investments given Victoria's commitment to reach net zero by 2045.
- Negative public narrative about alpine viability, especially in lead-up to snow seasons, erodes market confidence. While negative content often comes from well-intentioned advocacy groups with legitimate concerns about the future of alpine areas, it adversely affects visitation and hence the capacity of alpine communities to invest in adaptation.

Theme

Social & economic dimensions of adaptation

S03.5.4

Coasts and communities: Prioritising coastal adaptation using inclusive economic frameworks

A/Prof. Abbie Rogers

The University of Western Australia, WA, Australia

Abstract

The cost of damage to infrastructure and other assets in the coastal zone continues to increase, in line with the risks presented by coastal hazards. This has highlighted the importance of adaptation and hazard management actions, to increase resilience of coastal systems and either prepare or protect communities and valued assets. However, this is pitted against (i) the need to weigh up the pros and cons of different hazard management solutions, and (ii) managing existing and planned development in coastal zones to serve the diverse preferences of local communities and stakeholders, all while (iii) juggling resource constraints, including the need to balance coastal investments against the management of other public environments. Collectively, this creates a complex space for decision makers to make optimal decisions.

To inject consistency and transparency in coastal hazard and adaptation decision making, and increase inclusiveness of different stakeholder values, we are developing a prioritisation framework for coastal managers. A structural prototype of this benefit-cost analysis tool will be presented, demonstrating the potential of the tool in being able to integrate diverse social, environmental and financial values (benefits and costs) relevant to coastal management actions. The tool will help decision makers to explicitly understand the trade-offs implied by alternative management responses, including between maintaining the values associated with different natural or public assets, and protecting public or private infrastructure.

Theme

Social & economic dimensions of adaptation

S03.5.5

Participatory Approach and DSS for Adapting to Natural Hazard Risk

Professor Holger Maier¹, A/Prof Hedwig van Delden^{2,1}, Dr Aaron Zecchin¹, Mr Roel Vanhout², Mr Tim McNaught³, Mr Mike Wouters⁴, Mr Alen Slijepcevic⁵, Mr Luke Roberts⁶, Dr Graeme Riddell⁷, Dr Amelie Jeanneau¹, Mr Jeff Newmann⁸, Dr James Daniell⁹, Dr Doug Radford¹, Dr Sofanit Araya¹⁰, Emeritus Professor Graeme Dandy¹

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³Department of Fire and Emergency Services, Perth, Australia. ⁴Department for Environment and Water, Adelaide, Australia. ⁵Country Fire Authority, Melbourne, Australia. ⁶Department of Premier and Cabinet, Hobart, Australia. ⁷Marsh, Singapore, Singapore. ⁸SA Water, Adelaide, Australia. ⁹World Bank Group, Washington, USA. ¹⁰Department of Energy, Environment and Climate Action, Melbourne, Australia



Professor Holger Maier

Abstract

Natural hazards currently cost the Australian economy \$38 billion per year, which is expected to rise to between \$73 and \$94 billion by 2060 as a result of climate change, population growth and socio-economic development. In order to help governments and communities around Australia better understand and adapt to this threat, the Bushfire and Natural Hazard CRC funded the development and utilisation of the Unified Natural Hazard Risk Mitigation Exploratory Decision support system (UNHaRMED) from 2014 to 2024. UNHaRMED was co-developed and tested with a range of government agencies in Western Australia, South Australia, Victoria and Tasmania and consists of (i) a participatory process that helps end users better understand and adapt to natural hazard risk, (ii) a generic decision support software framework that can be used to develop UNHaRMED model applications in different geographical regions and different decision contexts. The UNHaRMED generic software framework is spatially explicit (generally working with a 100m x 100m resolution) and temporally dynamic (generally working with an annual timestep), and caters to multiple hazards (currently bushfire, earthquake and coastal and riverine flooding), exposure classes (e.g., buildings, agriculture, roads) and scenarios of future change (e.g., climate change, population growth, socio-economic development). It also enables the effectiveness of a range of combinations of adaptation options to be explored, including structural measures (e.g., dams, seawalls), land use planning (e.g., zoning), land management (e.g., prescribed burning) and changes to building codes (e.g., floor levels, building materials), both in terms of their location and timing. Over the last ten years, UNHaRMED model applications have been co-developed and applied with various end users for Greater and Peri-Urban Melbourne, Greater Adelaide, Tasmania and South-West WA and applied in a range of decision contexts exploring questions related to better understanding future risks and developing the most appropriate adaptation strategies.

Theme

Understanding & assessing hazards & risk

S04.1

Bridging Sectors for Resilient Futures – Collaborative Approaches to Adaptation Planning

Miss Sarah Leck, Mr Justin Story
Ricardo, Perth, Australia

Abstract

Effective climate adaptation requires coordinated efforts across diverse sectors, yet siloed approaches and misaligned priorities often hinder collaboration. This interactive workshop is designed to break down these barriers by fostering meaningful cross-sector dialogue and discussion of interacting benefits and challenges from adaptation strategies. This workshop will be fully participant-driven, ensuring that discussions reflect real-world challenges and opportunities.

The session will begin with participants grouped by sector (e.g. water, agriculture, transport) to identify key adaptation issues and challenges within their respective domains. These insights will then be shared in mixed-sector groups, where attendees will collaboratively explore cross-sector challenges, synergies, and opportunities for strengthening collaboration. Each group will present their key findings to the full workshop, highlighting the most critical sectoral interactions and proposing strategies for improving relationships and coordination.

Using structured facilitation techniques, the workshop will enable participants to map interdependencies, uncover barriers to collaboration, and develop concrete pathways for more effective cross-sector collaboration. The session will emphasize practical relationship-building strategies and real-time knowledge exchange, equipping participants with the insights and connections necessary for sustained collaboration beyond the conference.

Expected outcomes include a shared understanding of critical adaptation issues across sectors, ideas for opportunities for more effective action across sectoral boundaries, and strengthened networks for ongoing cooperation. By leveraging diverse perspectives and co-creation methodologies, this workshop will empower stakeholders to work together in advancing climate adaptation efforts that are more integrated, effective, and resilient.

Theme

Tell it, talk it

S04.2.1

Climate Adaptation for the Wild Fisheries Sector : WA perspective

Dr Arani Chandrapavan

WA Department of Primary Industries and Regional Development, Perth, Australia



Dr Arani Chandrapavan

Abstract

WA's ocean environment is facing many climate change impacts, from warming seas, rising sea levels, ocean acidification and increasing marine heatwaves events. The regional and seasonal climate variability and confluence of these impacts are becoming the largest risk to the sustainability of WA's wild-fisheries sector comprised of hundreds of finfish and invertebrate species captured across commercial, indigenous and recreational fisheries from the Kimberley to the South Coast. Adaptation planning for current and future impacts requires information about the directional shifts in species distributions and productivity as well as the rate of change under future climate projections. To do this, we require regional ocean- climate- ecosystem coupled models to evaluate future risks to inform scenario planning that could assist in developing alternate fisheries-management strategies. However, when it comes to the nearshore (up to 200 miles) coastal domain where the majority of our managed fisheries operate, there are limited accessible public-facing climate tools available for end-users. Thus, the biggest barrier to working towards better climate informed fisheries resource management is the lack of recognition and investment in the science required to understand WA's regional ocean climate and ecosystem impacts. In its absence, evidence-limited stock assessments and precautionary management approaches are currently applied to maintain sustainability. This leads to under valuing the adaptive capacity of our stakeholders, our fishing industries and the broader fishing community. Despite these challenges, climate change risks are being addressed through the selective use of WA's fisheries as case studies in broader state and national projects.

Theme

Other

S04.2.2

Balancing Profitability and carbon footprint in WA: Climate-Adaptive Sheep Farming

Dr Tafesse Estifanos^{1,2}, Dr Amir A Ghadim¹, Mr Christophe D'Abbadie¹, Mr Johnny Machon¹, Ms Kerrine Blenkinsop¹, Professor Ross Kingwell^{1,2}

¹Department of Primary Industries and Regional Development, Perth, Australia. ²The University of Western Australia, Perth, Australia

Abstract

Climate change presents substantial challenges to livestock production systems, necessitating adaptive strategies that consider both economic and environmental dimensions. Western Australian (WA) sheep enterprises face dual risks from growing season rainfall variability and market price fluctuations that threaten long-term sustainability. This study examines relationships between profitability, greenhouse gas emissions, and climate variability in WA sheep enterprises to identify factors contributing to adaptive capacity. Five years (2019-2023) farm-level data from approximately 200 sheep farms across different rainfall regions and agroecological zones (AEZs) from industry benchmarks are analysed. Economic modelling analysed gross margins while the Sheep and Beef Greenhouse Accounting Framework calculator estimated emissions.

We find that sheep enterprises in high-rainfall and medium-rainfall regions (H4, H5, M5) consistently outperformed low-rainfall regions (L1, L2, L3) in profitability, with significant temporal variation corresponding to climatic conditions and stocking rates. Profitability was highest during favourable conditions (2021-2022) with notable declines during less favourable periods (2019-2020, 2023). Top 25% farms-maintained profitability even during challenging periods, indicating enhanced adaptive capacity. Total emissions and emission intensities, predominantly from enteric methane, vary across regions and within farm performance groupings. Emissions are highest within high rainfall parts of the agricultural region, increasing from north to south, while emissions are lowest in low rainfall areas. Sheep meat emissions ranged from 5.6-6.6 kg CO₂-e/kg LW, while wool emissions ranged from 19.6-23.3 kg CO₂-e/kg greasy wool. A positive correlation exists between emissions and profitability, yet top-performing farms achieved 12-42% lower emissions than average farms.

Region-specific adaptation strategies are needed for vulnerable low-rainfall enterprises to manage emissions whilst maintaining sheep profitability. The significant performance gap between top and bottom farms may suggest that management practices from high-performing operations offers substantial potential for enhancing both economic and environmental resilience, particularly in managing the dual risks of rainfall variability and price fluctuations.

Theme

Social & economic dimensions of adaptation

S04.2.3

Perennial Answers to Persistent Problems: Planting in a Drying Climate

Mr Darren de Vos¹, Mr Johnny Machon²

¹Department of Primary Industries and Regional Development, Albany, Australia. ²Department of Primary Industries and Regional Development, Perth, Australia



Mr Darren de Vos



Mr Johnny Machon

Abstract

Western Australian farming systems face several adaptation challenges in the face of climate change. The Katanning Research Station, a research hub for the Department of Primary Industries and Regional Development, is implementing strategies to adapt to climate-related challenges and address land management issues while maintaining agricultural productivity. Operating as both a working farm and a research facility, the station spans over 2000 hectares, of which approximately 1575 hectares are arable. The station's mixed-farming system integrates sheep, pastures and cropping.

A drying climate with more frequent heat events and seasonal variability affects sheep welfare and pasture productivity. Furthermore, significant parts of the station are affected by salinity, reducing productivity. These dual challenges require solutions that address both concerns simultaneously.

Key adaptation strategies include the establishment of 80 hectares of saltbush, addressing salinity while providing valuable out-of-season feed options. As a perennial species, saltbush is particularly well-adapted to a drying climate. Other drought-tolerant saline species with potential economic benefits, such as agave, are also being investigated.

Alongside the saltbush system, revegetation of 55 hectares is underway, with over 50 local native species specifically selected to suit a drying climate. Special consideration has been given to planting trees in belts to provide wind breaks, shade and shelter benefits to grazing animals as well as in other areas bordering saline environments. The establishment of new trees is also expected to count towards the Katanning Research Station's target of reaching carbon neutrality by 2030. Future revegetation plans will focus on connecting remnant vegetation to increase landscape connectivity and support biodiversity.

This integrated approach to climate adaptation at Katanning Research Station offers practical insights for agricultural enterprises seeking to enhance resilience through strategic landscape management in a changing climate.

Theme

Adaptation in practice

S04.2.4

Cunyu Station: a climate-resilient pastoral systems in highly variable rangelands

Mr Christophe d'Abbadie, Dr Brad Plunkett

Department of Primary Industries and Regional Development, Perth, Australia



Mr Christophe d'Abbadie



Dr Brad Plunkett

Abstract

As climate change drives increasing climatic variation in Australia's semi-arid regions, the need for adaptive pastoral management systems becomes critical. This study examines the climate-resilient management practices implemented at Cunyu Station in Western Australia's Southern Rangelands from 1990-2017. The station's owners developed an adaptive system designed to thrive despite highly variable rainfall patterns, including extended dry periods and irregular rainfall events. Central to their approach was the rigorous control of Total Grazing Pressure from all herbivores, set at approximately two-thirds of carrying capacity to create an 18-month forage buffer. This buffer provided critical resilience during droughts and improved response to rainfall events, resulting in landscape rehabilitation, stable cash flows, and sustainable productivity. Bioeconomic modeling validates that this conservative stocking approach outperformed conventional strategies across 30 years of historical seasons. The Cunyu case demonstrates how integrated adaptive strategies—including water point management, ecological predator-prey relationships, and strategic infrastructure development—can create climate-resilient systems capable of withstanding the increased variability projected under climate change. This approach represents a significant climate adaptation strategy for similar landscapes globally, particularly as climate patterns become increasingly unpredictable. The findings provide practical insights for developing public policies that support pastoralists in their ecological stewardship role while improving both landscape condition and economic viability.

Theme

Adaptation in practice

S04.2.5

Cultivating Climate Resilience: Tolga Farm's Evolving Sustainable Mixed Farming System

Dr Brad Plunkett

DPIRD, Perth, Australia



Dr Brad Plunkett

Abstract

Keywords: Climate-resilient agriculture, Mixed farming, Soil health, Low emissions, Sustainable production

Abstract: This case study examines Tolga Farm, a 5,200 ha mixed sheep and cropping enterprise in Western Australia's low-rainfall wheatbelt, which has developed an innovative farming system that demonstrates effective climate adaptation strategies in dryland agriculture. Since 2004, Tolga has implemented a blend of conventional and alternative farming practices centred on building soil health, enhancing nutrient cycling, and maintaining a higher proportion of livestock than regional averages. The farm's approach includes phase farming with legume pastures, minimal synthetic inputs, deep-rooted tillage radish to manage soil compaction, and strategic liming to address soil acidity. Analysis shows that despite operating in a frost-prone, drought-vulnerable region, Tolga achieves exceptional livestock performance, improving crop yields, and evidence exists that it maintains soil organic carbon levels comparable to or up to 40% higher than district averages. Economic modelling indicates that while Tolga's profitability is around the median for farms in its rainfall zone, its profit variability is significantly lower, providing crucial climate resilience. Additionally, the farm's estimated greenhouse gas emissions (approximately 0.56T CO₂e/ha) are substantially lower than industry benchmarks. Its recently established audited premium supply chain with a local brewery demonstrates how climate-adaptive farming can create market opportunities that reward low-emission production methods. This case highlights the importance of promoting lower input mixed farming systems in climate adaptation policy as these systems have the potential to be both profitable and achieve climate resilience via lower profit variability, improved soil health, and lower emissions.

Funding source: Department of Primary Industries and Regional Development, Western Australia

Theme

Adaptation in practice

S04.3.1

Use of consultants in coastal adaptation planning: effectively using expertise

Ms Anne Leitch¹, Dr Aysin Dedekorkut-Howes¹, Dr Ingrid Baker²

¹Griffith University, Gold Coast, Australia. ²BMT Commercial Australia Pty Ltd, Gold Coast, Australia



Ms Anne Leitch

Abstract

Coastal councils are planning for coastal hazards in efforts to improve coastal resilience. This planning is hyperlocal and complex: requires diverse expertise, spanning community engagement, coastal engineering, environmental and social sciences, economics, and climate modelling. For many Australian local governments, particularly smaller ones with few staff, managing this range of expertise exceeds their already limited capacity and constrained resources. When government funding is available for coastal programs, these councils rely on professional consultancies that execute some or all phases of the planning process. Consultants bring specialized skills crucial for developing adaptive coastal strategies, this reliance offers both advantages and challenges.

This research aims to evaluate the benefits and drawbacks of using private consultants in coastal planning by local governments. We examined how councils can make the most effective use of consultants while considering the broader impact of privatization on coastal resilience. Specifically, we explored whether use of external expertise promotes or undermines capacity building and long-term cultural change within local councils.

We synthesize findings from two projects that included consideration of the use of consultants:

1. The development of guidance resources (via CoastAdapt.com.au) based on interviews with consultants in Queensland and Victoria, providing practical advice for councils on managing consultant relationships.
2. An evaluation of Queensland's QCoast2100 program, which funded local governments to develop Coastal Hazard Adaptation Strategies, involving 47 interviews with a broad range of stakeholders.

Our findings highlight lessons from past coastal adaptation projects, particularly in data collection, stakeholder engagement, and project implementation. We conclude that consultants need to be selected, briefed, and managed carefully for successful outcomes, with recommendations on improving the consultant-council dynamic, and supporting capacity building and learning in councils. Furthermore, we explore the broader implications of privatized consultancy for coastal resilience and capacity building, offering insights applicable to Australian and international contexts.

Theme

Adaptation in practice

S04.3.2

Local government climate practice - built from within

Ms Katrina Graham

NTARC, Hobart, Australia



Ms Katrina Graham

Abstract

Much is written, theorized and projected onto local government as to what its climate role should be, and how and where to prioritize its efforts. For the most part these perspectives and processes come from outside councils where their organizational functionality and reality is poorly understood. From experience these typically land awkwardly, do not build capacity and capability within their organizations and create reliance on external parties to deliver.

This presentation teases these challenges apart. It unpacks the unique executive led, and self-funded, Northern Tasmanian Alliance for Resilient Councils and its efforts to move beyond climate risk assessment and adaptation plans, and corporate carbon footprints to one where they are collectively measuring and reporting their progress on embedding and increasing strategic climate governance across their organizations. It is establishing clear and transparent framework to manage, monitor and disclose their climate governance action aligned to core jurisdictional roles and responsibilities, and the broader services and programs they deliver across communities.

Basing their efforts on a common approach supports the ready sharing of knowledge and experience, whilst enabling local responses based on individual resources and circumstances. It allows transparency for communities who are increasingly looking to the sector and expecting climate responses, guidance and leadership.

Their approach emphasizes the roles and responsibilities of councils in climate action and increasing their capacity and capability to mainstream climate governance and drive organizational change. Importantly it increases skills, knowledge and capacity for councils to take local action on emission reductions and adaptation strategies that:

- Increase the climate resilience of councils
- Increase climate transparency within council's and community
- Ensure alignment with emerging climate and sustainability reporting frameworks
- Support corporate and strategic planning for future and emerging risks and novel climates
- Normalize climate governance and action within the councils

This is their experience.

Theme

Decisions & governance

S04.3.3

Hyperlocal interventions for effective climate adaptation governance

ms suzanne dunford¹, Assoc Prof Brent Jacobs²

¹Waverley, Sydney, Australia. ²University of Technology Sydney, Sydney, Australia

Abstract

Climate change is a global phenomenon; however, climate impacts occur regionally in the context of multi-scalar influences from national governance structures to local cultural practices. Effective climate adaptation, therefore, is context specific, requiring consideration of local biophysical and socio-economic conditions as well as the shared risk perceptions of diverse community groups.

In keeping with other coastal areas of Sydney, Waverley Local Government Area (LGA) of New South Wales can expect to face multiple climate change impacts from sea level rise, more frequent and intense storms, and rising temperatures. However, in contrast to other LGAs, Waverley is one of the smallest in area and densest in population, with over 80% of residents in medium or high-density housing. As home to the world-famous Bondi Beach, it's also one of the most visited municipalities in Australia. Already, Waverley's community of residents and visitors are exposed to a unique situation that requires sharing of limited public open spaces and common areas, and which, potentially, engenders opportunities for shared knowledge, practices and experiences.

Hyperlocalism has been proposed as a method to mobilise the social and human capital of neighbourhoods to address vulnerabilities at a hyperlocal scale and align decision making with locally relevant risks to enable adaptation. Here, we compare three contemporary hyperlocal interventions designed to strengthen neighbourhood-scale climate resilience in Waverley: 1. the gamification of local resilience actions through intergenerational dialogues 2. the localisation of regenerative economic indicators through community-led discourse and 3. volunteer-led community stewardship and rewilding of private land. We discuss the role of innovation, participatory learning and novel engagement approaches by local government in developing enhanced responses to and governance of climate change, and the opportunities for and importance of scaling-out hyperlocal approaches to build multi-scale resilience.

Theme

Decisions & governance

S04.3.4

Scaling Adaptation for Local Government through Collaborative Alliances

Senior Policy Advisor Environment Jade Mains
WALGA, Perth, Australia

Abstract

Local Government faces several barriers when addressing climate change, impacting their ability to implement effective strategies and policies. These include funding constraints, capability gaps, undulating access to labour, all whilst responding to escalating climate risks and community expectation. This presentation will explore the opportunities of regional alliances to leverage the collective strength of multiple councils to rapidly scale up adaptation activities. By pooling resources, expertise, and funding these partnerships enable the development and implementation of comprehensive regional scale responses that surpass the capabilities of individual councils. Additionally, they strengthen relationships with other stakeholders and foster deeper connections to local communities. Whilst they are not without their challenges, partnership approaches underscore the importance of collaborative governance and a shared vision in tackling the complex challenges posed by climate change, offering a scalable model to support government policy and embody locally shaped, regionally driven and state-facilitated adaptation planning practices.

Theme

Decisions & governance

S04.3.5

Building Household Resilience: Sustainable Home Rebate Pilot Program

Ms Lisa Brideson, Mrs Ati Dadvar
City of Cockburn, Perth, Australia



Ms Lisa Brideson



Mrs Ati Dadvar

Abstract

Introduction:

As climate change intensify, households are on the frontline of change, facing rising energy cost, water scarcity, and extreme weather. In response, Sustainable Home Rebate Pilot Program was launched to empower residents to take practical, affordable steps toward a more resilient future. The program encourages the adoption of sustainable technologies and practices, enhancing their resilience to climate impacts.

Program Overview:

The program offers financial incentives for adopting climate adaptation measures such as energy-efficient appliances, water-saving fixtures, and home insulation improvements. Special attention is given to residents in financial hardship, who receive rebates through the City of Cockburn's financial counsellors and have a longer period for application. This presentation will discuss the program's design, implementation, and outcomes, offering insights for policymakers and practitioners.

Objectives:

1. Promote sustainable practices by removing financial barriers.
2. Enhance home resilience to climate-related stresses.
3. Foster community engagement in climate adaptation efforts.
4. Reduce carbon footprint through energy-efficient upgrades.

Methodology:

Implemented through the City of Cockburn, the program targeted the early adopters in the community, households who had received the City's home eco audits, to apply for rebates via an online portal. Participants could:

- select from a list of eligible sustainable items and upgrades.
- access personalised advice on purchases.
- participate in a tailored sustainable challenge.
- receive educational resources.

Results:

Preliminary results show strong engagement and positive feedback, with increased awareness of climate adaptation strategies. The program successfully demonstrated the feasibility and benefits of providing financial incentives for sustainable home upgrades, highlighting the value of household-level support in building community resilience.

Presentation:

The Sustainable Home Rebate Pilot Program is a promising approach to climate adaptation at the household level. By reducing financial barriers and promoting sustainable practices, the program empowers communities to build a more resilient and sustainable future.

Theme

Social & economic dimensions of adaptation

S04.3.6

Regional Collaboration for Climate Adaptation: Lessons from Queensland

Ms Maria Anselmo¹, Ms Karla Vaughan², Ms Sally Jensen³

¹FNQROC, Cairns, Australia. ²LGAQ, Brisbane, Australia. ³SEQCRA, Ipswich, Australia

Abstract

In Queensland, regional collaboration is a key pillar of local government climate adaptation efforts. Local governments are on the frontline of climate impacts and are required to effectively manage climate risks. In 2016, the Local Government Association of Queensland (LGAQ) established the Queensland Climate Resilient Councils (QCRC) program, which actively supports councils in forming regional alliances, without prescribing governance models. This allows flexibility in how partnerships are structured, playing a critical role to enable councils to work together across regional boundaries to strengthen climate resilience.

Nine years on, QCRC has engaged 54 councils, including seven First Nations councils, in strategic collaborative and regional adaptation efforts. Since 2021, the QCRC program has supported the establishment of two climate alliances with distinct governance structures that demonstrate the benefits of enabling regional collaboration among councils in driving climate action across Queensland communities.

- **Far North Queensland Climate Resilience Alliance (FNQCRA)** operates under the governance of FNQROC, providing direct access to CEOs and Mayors while fostering cross-sector collaboration.
- **Southeast Queensland Climate Resilient Alliance (SEQCRA)** is a formal partnership of eight councils working together on large-scale projects and regional climate solutions to achieve greater impact than individual efforts.

The benefits of councils collaborating through a regional alliance are to share resources, find economic efficiencies, leverage expertise from other councils, provide a mechanism for unified climate advocacy, challenge BAU processes, find common risks and impacts, remove political barriers and deliver outcomes beyond the scale of the individual council.

Our presentation will explore key insights from the two regional alliances and discuss how the different governance structures support the councils to collaborate for climate resilience.

Theme

Decisions & governance

S04.4.1

Accessible adaptation guidance for Australia's biodiversity

Dr Jenny Styger, Associate Professor Sarah Boulter
University of Tasmania, Hobart, Australia



Dr Jenny Styger

Abstract

Land and sea managers face enormous adaptation challenges, with climate change impacts compounding on decades of environmental degradation and biodiversity loss. To safeguard Australia's biodiversity into the future, land and sea managers must address the effects of current and future climate change in their planning and operations. To address this, the Climate Adaptation Initiative of the National Environmental Science Program (NESP) is developing Adapt Land&Sea – a central location for accessing resources and guidance for adaptation relevant to the biodiversity sector.

Adapt Land&Sea will feature adaptation work from across the National Environmental Science Program's four research hubs as well as a step-by-step guide for developing an adaptation plan supported with practical examples demonstrating how to use climate information in biodiversity conservation decision-making. The recently released Adaptation Catalogue for Conservation (AdaptLog), which provides a repository of adaptation interventions for species and ecological communities, will also feature.

In keeping with Adapt Land&Sea's central objective to be accessible, useable and useful, we are calling all biodiversity managers to help shape content and user experience through testing and reviewing products. By providing tailored and accessible climate adaptation guidance for land and sea managers, we hope to contribute to improving management of biodiversity threatened by climate change and climate-related extreme events.

Theme

Adaptation for natural systems, natural systems for adaptation

S04.4.2

Prioritised research to help improve WA inland waters' resilience

Mrs Sonja Mennen
WABSI, Perth, Australia



Mrs Sonja Mennen

Abstract

Western Australia's inland waters support unique ecosystems and endemic species that have evolved to withstand highly variable rainfall and fluctuating water levels. However, these fragile systems are increasingly threatened by climate change, human activities, and resource demands, impacting water availability, quality, and biodiversity.

To address these challenges, the Western Australian Biodiversity Science Institute (WABSI) is developing a collaborative research program focused on identifying and addressing key knowledge gaps related to inland water resilience. Through engagement with government agencies, industry stakeholders, researchers, and community organisations, a program has evolved that identifies critical areas such as water quality, extraction impacts, ecosystem functioning, and data-driven decision-making.

WABSI's Inland waters research program takes into account existing research with emerging climate threats and land-use pressures to develop research around adaptive management strategies and innovative solutions. Through a coordinated and well-governed research framework, the program aims to deliver actionable research outcomes that support the long-term sustainability and climate resilience of Western Australia's inland waters.

Theme

Decisions & governance

S04.4.3

Surviving Uncertainty: Water Supply Planning for the Unknown Future

Mr Daniel Visser

GHD Pty Ltd, Perth, Australia

Abstract

The planning of water and wastewater infrastructure for industrial areas faces extensive uncertainties, driven by fluctuating water demands, varied water quality requirements, changes in technology and unpredictable development timelines. Such challenges are acutely evident in the burgeoning hydrogen and ammonia hubs across Australia. These uncertainties necessitate robust, flexible, and adaptive planning methodologies to ensure sustainable and efficient resource management.

This presentation outlines the application of adaptive pathways planning and probabilistic modelling as innovative solutions to navigate uncertainties. The methodologies employed draw from experience on various green energy projects.

Key uncertainties in planning include:

- Fluctuating water demand based on industrial growth and technological changes
- Variations in water quality requirements for different industrial processes
- Timing and staging of infrastructure development
- Environmental, social, and regulatory constraints

Our approach involves the development of probabilistic water demand models that simulate various future scenarios, incorporating inputs from stakeholders and predictive analytics. This is complemented by a Multi-Criteria Analysis (MCA) to evaluate and compare different infrastructure options against numerous social, environmental, technological, and economic factors.

The results are visualized through adaptive pathways maps, which highlight the best routes forward while keeping alternative pathways open. These maps are integral in identifying triggers for change, ensuring that investments remain resilient and adaptable to future conditions.

These methodologies mitigate investment risks, prevent maladaptation, and provide actionable steps for adaptive planning. This framework is crucial not only for current industrial water planning but also for broader climate adaptation efforts. By enhancing resilience, this approach supports sustainable development goals and ensures that water infrastructure can withstand and adapt to the uncertainties associated with climate variability and change, providing long-term benefits to both industry and communities.

Theme

Cities, settlements & infrastructure

S04.4.4

HKH Policy Landscape on Springshed management to achieve Water Security

Ms Nabina Lamichhane^{1,2}, Dr Sunita Chaudhary¹, Dr Sanjeev Bhuchar¹

¹International Centre for Integrated Mountain Development, Kathmandu, Nepal. ²University of Tasmania, Hobart, Australia



Ms Nabina Lamichhane

Abstract

The Hindu Kush Himalayan (HKH) region, which is a home to critical water resources such as springs that sustain millions of people depending on drinking, domestic, and ecosystem services. These springs resources are increasingly drying up leading to water insecurity due to climate change, land use change and infrastructure development. This study analyzes the policy gaps for the development of springshed management across the HKH region, emphasizing the existing sectoral policies and governance structures. Despite of growing recognition of springs as a vital water source, there is absence of policy frameworks and strategic approaches to conserve, rejuvenate, and govern these resources.

Through a review of national policies, and strategies, the study identifies gaps and key barriers, including lack of spring focused policy, data paucity on spring hydrology, weak institutional coordination, limited technical capacity and community engagement. It highlights the absence of actionable guidelines for springshed restoration and insufficient integration of traditional knowledge with modern science. Additionally, governance structures often fail to address the cross-sectoral nature of springshed management, impeding sustainable development.

The findings underline the need for a robust policy and strong institutional frameworks that integrates scientific research, community participation, and regional collaboration. And the way forwards include developing springshed strategies, enhancing institutional capacities, and fostering multi-stakeholder partnerships. This analysis aims to inform policymakers, practitioners, and researchers, contributing to a resilient and sustainable water future for the HKH region.

Theme

Decisions & governance

S04.4.5

Climate change, natural emissions and urban air quality in 2050

Dr Kathryn Emmerson, Dr Marcus Thatcher, Dr Stacey Osbrough, Mr John Clarke
CSIRO, Aspendale, Australia



Dr Kathryn Emmerson

Abstract

Natural emissions from vegetation, sea salt and dust emissions are driven by meteorological variables, which will change in a future climate. Natural emissions can dominate air quality in Australia, particularly when high emissions from eucalypt trees promotes smog formation in summer. Therefore, quantifying how natural emissions might change is important. This study uses 4 downscaled Global Climate Models (GCMs) under 2 shared socioeconomic pathways in the 2050s to drive natural emissions at 20km spatial resolution in the CSIRO Chemical Transport Model.

Higher urban air mass stagnancy was predicted in winter. When combined with lower rainfall, increased particulate pollution is expected. By contrast, higher ventilation indices were predicted in summer. Higher wind speeds in the ocean facilitated additional sea salt particle emissions. As Australian cities are largely coastal, sea salt contributed ~35% of the 1-2 $\mu\text{g m}^{-3}$ extra coarse particulate matter predicted.

Peak summertime vegetation emissions are set to double in 2050, by 3-4 $\text{mg m}^{-2} \text{h}^{-1}$ in eastern Australia. These produce 3-6 ppb of additional ozone in Australian cities already at air quality limits. A worrying side effect of this chemistry might increase the lifetime of methane by half a year in response, which is a strong greenhouse gas.

This work is funded by the NESP2 Sustainable Communities and Waste hub.

Theme

Cities, settlements & infrastructure

S04.5.1

Breaking Barriers, Unlocking Solutions: A framework to enable effective adaptation

Dr Estefania Arteaga

World Adaptation Science Programme, Gold Coast, Australia

Abstract

Adaptation is a dynamic and iterative process rather than a one-time solution. Practitioners often face systemic challenges that hinder the implementation of effective adaptation strategies, including governance issues, financial constraints, knowledge gaps, and social barriers. This session will provide a structured framework to assess these challenges systematically and co-develop strategies to address them. By learning from past failures and successes, participants will enhance their ability to navigate the adaptation landscape and contribute to more effective and equitable climate resilience efforts. The presentation will introduce the framework developed in the published study [Unpacking the theory-practice gap in climate adaptation](#) and showcase its application in a real-world case study, demonstrating how barriers and enablers were identified and addressed. This framework provides a comprehensive way to evaluate adaptation challenges at different levels, offering a structured approach to understanding systemic constraints and opportunities. The case study will provide an evidence-based illustration of how the framework has been applied in practice, emphasising lessons learned and potential improvements.

Theme

Adaptation in practice

S04.5.2

Islands of Hope: Climate Change Adaptation in the Maldives

Dr Sergio Jarillo

The University of Melbourne, Melbourne, Australia



Dr Sergio Jarillo

Abstract

Emotions are key drivers of individual and collective action. Hope for instance brings distant goals closer by showing that 'something can be done' about the future and therefore promoting attitudes and behaviours that help reach that future. Because of this, hope can play an important role in determining the adaptive capacity of communities. Understanding where and how hope manifests in different vulnerability contexts is important for learning about the role of hope in supporting adaptation and human well-being through a changing climate. This presentation looks at the role of hope in the Maldives – a country that is highly exposed to climate change risks, yet also with substantial change in island landscapes due to rapid economic development. Using qualitative and quantitative methods in eight Maldivian islands, this large-scale study (n=322) assessed peoples' observations of climate change and impacts, their evaluations of on-island adaptation projects, their perceived collective self-efficacy, and their expectations of the future. The results show that despite observed environmental changes and awareness of the risks these pose to island life, Maldivians remain hopeful about the future. Two factors seem most important. First, the conspicuous presence of development projects mean Maldivians can 'touch' adaptation in their everyday lives and so appreciate that adaptation can and is being implemented (albeit often incidentally, and not necessarily sustainably). Second, Maldivians have confidence in their ability to envision a shared future and act collectively to pitch that vision to Government and funders to steer adaptation. These factors give people hope, and are an important capability upon which to base future adaptation initiatives. They suggest, more broadly, that implementation of tangible adaptations that stimulate collective action may catalyse hope, which in turn enables further adaptation and human well-being.

Theme

Social & economic dimensions of adaptation

S04.5.3

Empowering women for better climate change adaptation in Southeast Asia

Mrs Erni Astutik^{1,2}, Professor Mu Li¹, Dr Elizabeth Kirkwood¹, Associate Professor Ying Zhang¹

¹Sydney School of Public Health, Faculty of Medicine and Health, The University of Sydney, Sydney, Australia. ²Faculty of Public Health, Universitas Airlangga, Surabaya, Indonesia

Abstract

Southeast Asia is a region highly vulnerable to climate change. Climate change has exacerbated gender inequalities, and women are particularly vulnerable. Although women play crucial roles in families and communities, they are generally neglected in climate change adaptation. This literature review aims to explore the role of women's empowerment in addressing climate change in Southeast Asia and the challenges they face. We systematically searched articles from six databases (Medline, Scopus, Web of Science, Embase, CINAHL, and PsycInfo), using pre-determined keywords without limiting the year of publication. Due to the few studies identified, we presented a narrative review that focused on the methodological framework in studying women's empowerment and its role in climate change adaptation. Women have significant social and family responsibilities, such as their involvement in agriculture, waste management, food and water supply, and main carer for children's health, there is a great potential for women to foster climate adaptation strategies at various levels. Additionally, women can contribute to risk communication and assist climate-related decision making. However, there are still challenges faced by women in this region, such as gender inequality, limited access to resources, low levels of education, and lack of decision-making power, which need to be addressed through culturally sensitive women empowerment initiatives to build resilience to the climate crisis in Southeast Asia.

Keywords: adaptation, climate change, gender, women's empowerment, Southeast Asia

Theme

Adaptation in practice

S04.5.4

Overcoming barriers to climate adaptation in the WA sheep industry

Mrs Janet Conte, Dr Kevin Foster

Department of Primary Industries and Regional Development, Perth, Australia



Mrs Janet Conte



Dr Kevin Foster

Abstract

There is a growing body of literature on barriers to climate change adaptation (CCA), but limited research has been conducted in Western Australia (WA). The exception is the work of Kragt et al. (2013), who developed an interdisciplinary framework identifying barriers such as climate change uncertainty, availability of viable strategies, varying levels of adaptive capacity (institutional, technological, financial, knowledge, and social) and willingness to adopt. Previous economic analysis reveals that without adaptation, climate change will reduce on-farm profit and increase its variability across all rainfall zones by 2050. The FutureSheep project aimed to better understand these barriers within the WA sheep industry.

A literature review was conducted and the project's reference group of producers and agricultural advisors was consulted. We found that most barriers were related to adaptive capacity, particularly lack of self-efficacy and financial concerns, including uncertainty around returns, commodity prices, and financial markets. Barriers related to willingness to adopt new practices were also identified, though there was limited mention of the availability of viable adaptation strategies. These barriers were specific to location, audience, and adaptive practices. Discussions with some producers identified knowledge, and extension gaps crucial for preparing adaptation strategies.

Overall, our findings support Kragt et al.'s framework, but more research is needed to explore barriers to CCA across a larger cohort of producers, advisors and regions. While it is simpler to identify barriers in relation to a particular practice in question, barriers could also be identified to adaptation planning. The uncertainty regarding the timing and severity of climate change impacts makes it difficult for some producers to justify pre-emptive adaptation. However, the implementation of adaptation strategies will be essential to maintain resilience of WA sheep production systems. More targeted, region-specific research and support for producers are needed to overcome these barriers and promote effective climate adaptation strategies.

Theme

Decisions & governance

S04.5.5

Spatial data providing the tools to enable climate adaptation

Mrs Sarah White

Green Adelaide, Adelaide, Australia



Mrs Sarah White

Abstract

In a powerful example of multi-partner collaboration, Green Adelaide partnered with state government and metropolitan councils to map greater Adelaide's urban heat and tree canopy. This region-wide dataset provides a clear picture of how relationships between Adelaide's tree canopy, green spaces and built environment influence the impacts of urban heat, thus identifying communities vulnerable to climate change. Application of consistent methodologies across multiple time periods enables us to track changes in our urban environment. The data captured informs policy and planning, prioritises future climate mitigation investment, and measures the effectiveness of strategies in the long term.

Metropolitan councils integrate the spatial data to inform better decisions for their communities. This has enabled implementation of a variety of practical solutions; building resilience and adaptive capacity to climate change and the increasing risks and frequency of heatwaves. Examples include blue and green infrastructure strategies, heat wave refuges and urban greening. With repeated captures, project partners can evaluate the success of policy and climate change mitigation strategies to inform future planning decisions for their communities.

Spatial analysis has identified priority areas for targeted investment in climate mitigation solutions. Tree canopy, urban heat and green spaces data were combined with census data relating to socioeconomic, health and age-related vulnerability. The analysis identifies areas and communities where support is needed to build resilience to climate change impacts and work towards equitable access to cooler, greener spaces. The areas identified display a combination of high social vulnerability factors, low percentages of green spaces and tree canopy cover, and high percentage of artificial surfaces and exposure to urban heat. Results have highlighted how the most vulnerable communities are already experiencing the greatest climate change impacts. Future captures will enable Green Adelaide and partners to monitor our impacts as we work towards a more equitable, climate resilient Adelaide.

Theme

Adaptation in practice

S04.5.6

Barriers to court verdicts in addressing climate vulnerable coastal infrastructure

Judge Hossain Mohammad Reza

The University of Melbourne, Melbourne, Australia. Bangladesh Judicial Service, Dhaka, Bangladesh



Judge Hossain Mohammad Reza

Abstract

As climate change reshapes coastlines and intensifies vulnerabilities, climate adaptation litigation has become a powerful tool to integrate climate risk into environmental assessment and infrastructure planning. There are also examples where courts have required the consideration of climate change impacts in coastal planning and development and construed existing statutory language to necessitate a greater focus on adaptation concerns. However, are courts always the appropriate place to address climate change adaptation requirements? In some contexts, the separation of powers, standing, and political question often have had a dampening effect and have been raised to prevent courts from reaching the merits in important climate change cases.

This paper seeks to answer a critical question: why, in Bangladesh, a country on the frontlines of climate vulnerability, the Supreme Court has yet to play a transformative role in integrating climate adaptation into planned coastal infrastructure? Employing doctrinal and empirical analysis, incorporating twenty-five in-depth interviews with judges, lawyers, and scholars (conducted under ethics approval from Melbourne Law School), this paper maps the structural and judicial constraints unique to Bangladesh that blunt the force of climate litigation in the country.

Following a chronological structure, this paper addresses pre-litigation barriers (public awareness deficits, procedural complexities, resource constraints), judicial challenges during litigation (the struggle to apply outdated statutes, compromised independence, reliance on incomplete data), and post-judgment hurdles (weak enforcement, lack of monitoring, and reluctance to impose strong remedies). The paper finds that these barriers are not isolated but interconnected, compounding each other across time and institutional layers. This paper argues for a holistic pathway forward: empowering communities, increasing judicial capacity, and building enforcement into the very scaffolding of environmental governance. The paper offers insights relevant not only for Bangladesh but also for similarly situated jurisdictions seeking to utilise litigation as a tool for advancing climate adaptation goals.

Theme

Cities, settlements & infrastructure

S05.2.1

Understand water-climate connections for informed WA adaptation with WACWA

Ms Nicole Harvey

Department of Water and Environmental Regulation, Perth, Australia



Ms Nicole Harvey

Abstract

The *Water and climate in Western Australia* (WACWA) web resource series shares hydroclimate science relevant for WA that is credible, comprehensive, up-to-date, engaging and manageable. It answers key questions for WA adaptation planners, water practitioners, policymakers and researchers. It also explains insights that benefit general community members who are interested in WA climate–water topics.

Water in WA is changing, in ways that demand difficult and important decisions to be made. And water affects essentially all WA climate adaptation activities. So, many people are trying to respond to the puzzles of our shifting water systems and climate.

Yet useful information about WA's hydroclimate is often hard to find, synthesise and act on. The Department of Water and Environmental Regulation produced WACWA to bridge this crucial gap and boost adaptation efforts in WA.

The WACWA e-resource:

- explores WA's climate, water resources and atmospheric system and the – already experienced and future – climate change impacts on them
- details best practice advice from a WA perspective for using climate models and projections
- uses plain language, thorough explanations, and lots of easy-to-understand diagrams and data visualisations
- facilitates constructive conversations – which are vital as diverse stakeholders work together, developing and implementing evidence-based solutions to adaptation challenges in WA.

In the lightning talk time, share in the WACWA team's key learnings, find out about the web series' multimedia highlights, and discover the WACWA interactive article that examines a WA hydroclimate concern on your mind.

Water and climate in Western Australia seeks to inform and transform our collective understanding, enabling more effective Western Australian climate adaptation.

Theme

Decisions & governance

S05.2.2

Asset Management for Green Infrastructure – Best Practice Guidance

Dr. Jacqueline Balston¹, Mr. Martyn Glover², Sinead Bullock²

¹Institute of Public Works Engineering Australasia, Adelaide, Australia. ²City of Gosnells, Gosnells, Australia



Dr. Jacqueline Balston

Abstract

Nature-based Green Infrastructure assets are managed by Councils to provide essential, cost effective, sustainable, climate-resilient services and community wellbeing and environmental co-benefits. However, a lack of best practice guidance means most are not included in asset management planning with the risk they are undervalued, unfunded and investment is wasted.

The IPWEA *Asset Management for Green Infrastructure* project is developing a best practice e-book containing practical knowledge, supporting tools, tables and templates and an online learning program for Council asset and financial managers, environment officers, engineers and consultants. The project deliverables will bridge the knowledge gap, overcome barriers, and empower asset managers to confidently integrate green infrastructure into their financial and asset management plans.

Outcomes will be the inclusion of Green Infrastructure into asset management registers and strategic, long-term financial and asset management plans to optimise the services and co-benefits that nature-based options can provide for our communities. There is also the potential to increase the uptake of nature-based assets, ensure their care is effectively resourced and funded, enhance the services they can provide, build climate resilience and reduce greenhouse gas emissions and impacts to the environment.

Content will include: land, water and coastal Green Infrastructure assets; valuation and condition assessment methodologies; co-benefits; service provision; demand management; lifecycle analysis; risk assessments; long-term strategic and financial management planning; costs; threats; case studies; decision tools and templates.

The *Asset Management for Green Infrastructure* project will be completed in December 2025 and opportunities to contribute are available.

Theme

Adaptation for natural systems, natural systems for adaptation

S05.2.3

Making adaptation harder than it needs to be

ms suzanne dunford

Waverley Council, Sydney, Australia

Abstract

If climate adaptation is not required at a local level, regional vulnerabilities will only worsen, and national or global resilience will never accumulate. But support and requirements for local government to undertake risk assessments or implement adaptation actions are lacking in Australia. It's no-one's job, it's hard to apply to capital budgets and it get left to champions or voluntary bodies to deliver. A multiscale, coordinated approach to assessing and addressing climate risks is urgently needed, harnessing the power of reporting, at all levels of government.

Theme

Decisions & governance

S05.2.4

Finding signals in the noise of scenario analysis disclosure statement

Dr Caa Sttitzlein, Dr Andrew Terhorst, Dr Claire Horner
CSIRO, Sandy Bay, Australia

Abstract

Scenario analysis is a critical requirement of AASB S2, ensuring that businesses consider global benchmarks and respond to their disclosed climate risks. Different warming futures present different – often accelerating – consequences, and so through this requirement, businesses must consider impacts in different future contexts and conditions. Ideally, this section of disclosure reporting combines quantitative and qualitative elements to demonstrate that businesses meaningfully consider issues of materiality, adaptation responses and governance strategies related to one or more plausible futures.

In this lightening talk, we propose a ‘signal to noise’ hypothesis to explore how the quality of a scenario analysis can be understood through detecting components of data (the signal, such as emissions baselines) and narrative (the noise, such as conditions of markets or stakeholder sentiment). Typically applied in engineering of light and sound, we believe reframing the signal-to-noise concept to this context can spark discussion about how these scenarios are being developed and assessed. With some opting to turn up the signal by emphasising data-driven trajectories, others suggest that informed socioeconomic trends will boost the overall quality and value of scenarios produced.

Theme

Social & economic dimensions of adaptation

S05.2.5

Plantation management in a drying climate

Dr Stuart Crombie

Forest Products Commission, Perth, Australia



Dr Stuart Crombie

Abstract

The Forest Products Commission of WA manages 61200 ha of pine plantations providing 70% of WA's pine product. Rainfall has declined nearly 20% since the 1970s. A further 18% decline projected by 2090 along with a doubling of drought frequency and fire conditions becoming more severe. These conditions challenge current pine silviculture in WA. Successful climate change planning depends on making climate change planning part of 'business as usual' supported by staff open to changing previous plantation practices where necessary. Adaptations are being made in land acquisition, silviculture, harvest scheduling and product development. Continual monitoring of plantation condition including by satellite for NVDI is underpinning continuous improvement and adaptation of silviculture to changing conditions.

Theme

Adaptation for natural systems, natural systems for adaptation

S05.2.6

Successful adaptation- WA farmers produce more grain from less rain

Ms Jackie Bucat¹, Dr David Bowran²

¹DPIRD, Perth, Australia. ²Yaruna Research, Northam, Australia



Ms Jackie Bucat

Abstract

Western Australian wheat farmers have successfully adapted to climate change, achieving higher grain yields despite a significant decline in rainfall during the growing season. Generally, grain yield is closely tied to rainfall during the growing season (April–October). Records show a decline in average rainfall from 464 mm (1950–1974) to 382 mm (2000–2024) across the wheatbelt. Average wheat yields have increased from 1.02 t/ha to 1.8 t/ha, in spite of this challenge.

This remarkable progress is attributed to WA agri-innovation; farmers' willingness to experiment and rapidly adopt innovative practices, in combination with government, university and industry research in agronomy and soils, crop breeding and herbicide development.

Weeds are a major challenge to cropping and were managed through tillage, including ploughing, scarifying, and seeding. Tillage exposed the fragile soil to drying, water loss and wind erosion. The advent of herbicides revolutionised weed management, enabling farmers to reduce tillage passes. Farmers had to design, build and calibrate their own spray equipment, as these were not available to buy.

Building on this innovation, a WA farmer and government researchers pioneered 'direct drilling,' which involves seeding with only one cultivation pass. In the 1990s, another WA farmer enabled widespread adoption of 'no-till' by developing a 'knife-point', the Harrington point. Knife points cultivate below the seed while leaving the inter-row area undisturbed.

In the 2000s, northern growers embraced 'dry seeding', which is planting before the break of season, to conserve water. This also allowed crops to begin growing immediately after the first rains and maximise productivity in shorter seasons.

Recent government research demonstrated the benefits of very early sowing and growers adopted this after Cyclone Seroja.

WA growers have demonstrated resourcefulness and resilience in adapting to the to the climate change already evident for the ongoing success of the grains industry.

Theme

Adaptation in practice

S06.1

Craft an adaptation intervention business case for a species/place

Dr Alistair Hobday¹, [Dr Claire Mason](#)^{1,2}, Dr Jason Hartog¹, Dr Jess Melbourne-Thomas¹, Associate Professor Sarah Boulter², Dr Jenny Styger², Ms Lin Dai³

¹CSIRO Environment, Hobart, Australia. ²University of Tasmania, Hobart, Australia. ³Queensland University of Technology, Brisbane, Australia

Abstract

A growing number of conservation organisations and government departments in Australia are embarking on climate adaptation planning and implementation for the natural systems they manage. The Adaptation Catalogue for Conservation (AdaptLog) is an online, searchable repository of conservation interventions for species and ecological communities that explicitly consider climate change. We have developed this resource to help people access and explore a wide range of options for managing species, ecological communities and protected places under climate change. Assessing options requires thorough examination and judgement of a myriad of factors such as feasibility, risks, cost, possible unintended consequences, benefits, and reversibility, just to name a few. We present a framework and resources for exploring and assessing these various considerations associated with intervening in natural systems through a lens of climate adaptation. We host an interactive session where participants will work through a business case template for selecting an option to test. Participants will navigate and report on the various considerations and come away with a draft plan for implementation that considers short- and long-term climate change.

Theme

Adaptation for natural systems, natural systems for adaptation

S06.2.1

Building for the Future - incorporating future climate considerations

Dr Ramona Dalla Pozza^{1,2}, Dr Surendra Rauniyar³, Dr David Hoffmann³, Mr Zhengen Ren⁴, Mr Anthony Wright⁴, Dr Doerte Jakob³, Mr Michael Ambrose⁴, Dr Anir Upadhyay⁵, Mr Daniel Daly⁶, Mr William Tolis⁷, Mr Tim Le Mesurier⁶, Ms Hannah Bubb⁶

¹NESP Climate Systems Hub, Melbourne, Australia. ²University of Tasmania, Melbourne, Australia. ³Bureau of Meteorology, Melbourne, Australia. ⁴CSIRO, Melbourne, Australia. ⁵University of NSW, Sydney, Australia. ⁶Department of Climate Change Energy and the Environment (Australia), Canberra, Australia. ⁷Department of Climate Change Energy and the Environment (Australia), Canberra, Australia



Dr Ramona Dalla Pozza

Abstract

Current building energy efficiency modelling for approval of new buildings is assessed using a sample of actual weather data from that past. However, as our climate is changing, and as buildings designed today have an expected life-span of approximately 50-70 years, building designs need to consider the climate of the 2070s, including extremes such as heatwaves, to keep occupants comfortable and healthy. This project pilots' new approaches of incorporating impact of future climate change into building energy efficiency modelling.

The NESP Climate Systems Hub is working with the residential and commercial building areas within the Energy and Performance Security Division of the Australian government, along with members of the ABCB, the Bureau of Meteorology, CSIRO Energy, Australian Climate Service, University of New South Wales, and various state-based building energy efficiency teams to derive weather files better suited for a changing climate.

Through co-design with residential and commercial building policy staff in the Australian government, and with industry experts and other stakeholders, this project will contribute to improved policy outcomes for NatHERS (Nationwide House Energy Rating Scheme) and NABERS (National Australian Built Environment Rating Scheme), as well as influencing the 2028 update to the National Construction Code for residential buildings.

We would like to acknowledge funding and in-kind support through Australian Government NESP Climate Systems Hub and partners, CSIRO Energy, the Australian Building Codes Board (ABCB) and the National Partnership for Climate Projections (NPCP).

Theme

Cities, settlements & infrastructure

S06.2.2

Designing energy efficient buildings in a changing climate

Dr Doerte Jakob¹, Dr Surendra Rauniyar¹, Dr David Hoffmann¹, Dr Ramona Dalla Pozza², Mr Ben Liley³

¹Bureau of Meteorology, Melbourne, Australia. ²University of Tasmania, Melbourne, Australia. ³NIWA, Lauder, New Zealand



Dr Doerte Jakob

Abstract

Important considerations when designing buildings are energy efficiency and the thermal comfort of the occupants. Given the lifespan of buildings, those built today should be designed to perform in a world that has warmed by 2C or more. The urban heat island effect in larger cities where most Australians reside also needs to be considered. Incorporating these elements into planning will aid in the development of future adaptation and mitigation strategies and building design codes and ensure Australia's buildings are resilient and energy efficient in our future climate.

Our presentation reports on the development of a new methodology for determining climatological design specifications through the National Environmental Science Program (NESP) Climate Systems Hub 'Building for the future' project that commenced in early 2025. This project brings together climate scientists and industry practitioners to establish a methodology, in co-design with residential and commercial building policy staff in the Australian Government and experts in industry.

Current methodology is built on hourly annual weather files, often a Typical Meteorological Year (TMY) file, derived from a historical sample of weather data collected over a span of more than 15, and preferably 30, years. Our new methods will expand on the existing approach by updating climatological information used in design to characterise 'typical conditions' representing the current climate, adding data for simulations for future climate for typical years using up-to-date regional climate projections information (CMIP6) and by producing data to characterise future heatwave conditions. In consultation with stakeholders, we seek to define a baseline to characterise the 'current' climate and select application-relevant scenarios and time horizons. The final product will be updated in line with updates to climate projections becoming available through the roughly 5-year Climate Model Intercomparison (CMIP) cycle and in consideration of stakeholder requirements.

Theme

Cities, settlements & infrastructure

S06.2.2

Designing energy efficient buildings in a changing climate

Dr Doerte Jakob¹, Dr Surendra Rauniyar¹, Dr David Hoffmann¹, Dr Ramona Dalla Pozza², Mr Ben Liley³

¹Bureau of Meteorology, Melbourne, Australia. ²University of Tasmania, Melbourne, Australia. ³NIWA, Lauder, New Zealand



Dr Doerte Jakob

Abstract

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Theme

Cities, settlements & infrastructure

S06.2.3

Place-based and spatial patterns for regional adaptation pathway planning

Mr Paul Box¹, Dr Russ Wise²

¹CSIRO, Sydney, Australia. ²CSIRO, Canberra, Australia

Abstract

Place-based adaptation requires methods and processes to assist decision makers to explore complex bio-physical, socio-economic, technical and institutional systems, and their interactions across scales. To meet this need and develop localised risk-informed climate resilient solutions that align with strategies, priorities and drivers across multiple scales, CSIRO and the NSW Department of Planning Housing and infrastructure (DPHI) developed a Regional Adaptation Pathways Planning (RAPP) process.

Development of a Multi-hazard Disaster Opportunity and Risk Assessment (MHDORA) methodology, encompassing an approach to developing place-based adaptive pathways across heterogeneous regions, was a key aspect of the RAPP. The 'use case' to demonstrate the MHDORA and RAPP was 'delivering safe and affordable housing in the Illawarra Shoalhaven region, NSW', in the context of increasing climate and disaster risks.

The concept of 'place', however, is a social construct and can be defined at multiple scales. To address this scalar nature of adaptation and the complexity of cross-scale system interactions, a pattern-based approach to place-based adaptation planning was developed as part of the MHDORA. This involved defining patterns (or archetypes) of place, combinations of settlement type and landform, together with spatial patterns of interaction between settlement types. These patterns were then used in local deliberations to explore inter-place risks and opportunities for representative archetypes and in so doing underpinned the development of the place-based adaptive pathways.

A place-based approach such as this provides a conceptual basis for developing localised solutions aligned with broader regional strategies and priorities. It also implies a focus on people and the decisions they need to make. In doing so, the approach facilitates participative deliberations to reconcile multiple often contested value drivers across domains, geographies and timeframes.

This talk will describe pattern development, reflect on their utility in developing adaptive pathways for delivering safe and affordable housing, and provide broader implications for practice.

Theme

Cities, settlements & infrastructure

S06.2.4

Projected weather files for Australian building energy simulation

Dr Zhengen Ren, Mr Zhi Tang, Ms Melissa James, Mr Anthony Wright
CSIRO Energy, Melbourne, Australia



Dr Zhengen Ren

Abstract

In building performance simulation, accurate weather data is essential for predicting a building's thermal behaviour, energy usage, and indoor comfort. Growing awareness of climate change and its impact on the built environment has driven significant interest in future weather files for building simulations. With support from the Department of Climate Change, Energy, the Environment and Water, projected weather files were created by 'morphing' the reference meteorological year (RMY) data with projected data that were generated with downscaled projections from eight typical global climate models (GCMs). These projections were based on three Representative Concentration Pathways (RCP2.6, RCP4.5 and RCP8.5) for four future periods: the 2030s, 2050s, 2070s and 2090s.

For residential building simulations, the data are provided in the Nationwide House Energy Rating Scheme (NatHERS) RMY format. For commercial building simulation, the data are available in standard EPW (EnergyPlus Weather) format and also in RMY for commercial buildings format (retaining the .epw file extension for compatibility with EnergyPlus). To adapt NatHERS RMY weather files for commercial building simulations, we converted them into RMY for commercial buildings format by adjusting time step (e.g., shifting hour 0 to hour 1, hour 23 to hour 24) and converting irradiance (W/m^2) at hour 0 to represent the irradiation over the period from hour 0 to 1, and so on. We also generated the additional parameters required by EnergyPlus (e.g. Relative Humidity and Dew Point Temperature).

A case study on a large office building used both standard EPW and RMY for commercial buildings format weather files for present-day conditions and future projections (2030s, 2050s and 2070s) across Darwin, Sydney, Melbourne, Adelaide and Hobart. In general, results showed that the difference in energy consumption for space heating and cooling between these two different weather formats was less than 5%.

Theme

Cities, settlements & infrastructure

S06.2.5

Including Financial Risk in Climate Risk Assessments of Critical Infrastructure

Dr Geoff Lee¹, Mr Gabriel Dennis², Dr Raymond Cohen¹, Dr Nikhil Garg¹, Dr Mahesh Prakash¹

¹CSIRO's Data61, Melbourne, Australia. ²CSIRO's Data61, Brisbane, Australia

Abstract

There is currently an increasing demand for climate risk assessments due to several factors including:

- New regulatory requirements of annual climate related financial disclosures for medium to large businesses (e.g. ASRS2)
- Public and private sector management of existing assets and planning future infrastructure needs
- Emergency managers needing to understand how to prepare for changing hazards

This work presents a novel approach to assessing the risks associated with climate hazards impacting a range of different assets and causing both physical damage and disruption to productivity due to that damage. This multi-hazard approach is demonstrated through the assessment of three critical infrastructure sectors, namely Transport, Energy and Telecommunications. Firstly, this work presents a Multi-Hazard Severity Score metric to examine regions where hazard severities change through climate variability. This metric is used in conjunction with infrastructure datasets to assess the hazard severities where infrastructure assets are located. To complement this analysis, this work introduces a Social Cost metric that quantifies the cost of infrastructure becoming unavailable due to climate hazard impacts using the Transport infrastructure sector as a case study. Presenting these two metrics in one unified approach allows policy makers to decide which of the two best suits their specific policy decision needs. Case study results indicate that broadly speaking climate change will have an increasing risk impact on critical infrastructure. However the changes in risk profile can be quite different for different asset classes and also variable across LGAs in Australia.

Theme

Understanding & assessing hazards & risk

S06.2.6

BRM's: The building blocks of coastal protection

Mr Matthew Lee

Department of Transport (Maritime), Perth, Australia

Abstract

When considering planning actions for coastal zone management, considerable emphasis is placed on the cost benefit analysis associated with the proposed actions however, this requires reasonable certainty as to both sides of the equation and, whilst it is acceptable to make assumptions these must be reasonable and considered. One key assumption which has the potential for an order of magnitude impact on the estimated cost of the works is around the availability of appropriate basic raw materials to complete the proposed engineering works, typically sand and rock.

This was recognised in the works completed by Seashore Engineering (2019) for the Department of Transport, namely the Assessment of Coastal Erosion Hotspots in Western Australia and led the Department, supported by the CoastWA program, to undertake a study into the supply of appropriate basic raw materials and issues which may potentially impact existing supply and the required growth in supply for the future.

It is the intent of this presentation to look at the demand for basic raw materials for coastal engineering applications, contrasting this against the broader demand for similar materials, and make comment as to the potential growth in demand for both. We shall also discuss the challenges around the existing and future supply considering both the regulatory framework and wider planning constraints which have been identified by industry participants and opportunities to address these challenges. Further, we shall discuss options with respect to alternative materials which could be used to address any potential shortfall in materials and, additionally, alternative sources of materials which are not yet being utilised and the various requirements to access these sources.

Theme

Decisions & governance

S06.3.1

More-than-climate politics in rurality: Normative pathways for living with loss

Prof. Petra Tschakert^{1,2}, Dr. Alicia Wheatley¹

¹Curtin University, Perth, Australia. ²National University of Singapore, Singapore, Singapore



Prof. Petra Tschakert



Dr. Alicia Wheatley

Abstract

Adaptation debates on reparative futures and inclusive governance underscore the need for grounded engagements with the many ways in which local values and concerns, systemic disadvantage, and lived experiences with climatic hazards and changes are entangled. In the age of turbulence and intersecting crises, such insights compel us to examine temporalities of loss, grief, and hope while also exploring spaces for deliberative processes and normative pathways toward transformative change. This means understanding the entwined climatic and socio-economic changes that shape complex and fluid realities. In the context of rural and regional Australia, such a focus is often at odds with governmental rhetoric around rural resilience and the idealised essence of self-sufficient adaptation.

Here, we assess how values- and place-based adaptation pathway planning offers a relational complement to state-driven climate risk assessments and resilience imperatives. By employing an innovative, iterative, and participatory methodology in a regional tree-changer town in Western Australia, we investigate social and environmental dilemmas of precarity, continuity, and hope and illustrate how residents engage in difficult trade-offs to decide what to save and what to let go against the backdrop of increasing fires, drought, and heat. We find that the affective dimensions of lived values are under distress whilst a more-than-climate politics is a compelling lens for examining diverging temporalities of loss in rural settings where some cherished aspects of lives and lifestyles will not be salvageable. Climatic hazards, alongside changing demographics, strains to community cohesion, and at times governmental neglect, narrow desirable pathways for restorative futures. We advocate for relational stewardship approaches in rural adaptation and resilience-in-the-making that counteract current modes of climate governmentality. Such relationality validates place-based values and more-than-human harm while also remedying ongoing injustices through careful, deliberative experiments to prefigure normative community trajectories.

Funding: Australian Research Council

Theme

Decisions & governance

S06.3.2

Practitioner perspectives on social wellbeing in rapidly growing coastal communities

Dr Carmen Elrick-Barr^{1,2,3}, Professor Tim Smith^{4,1,5,6,7}, Associate Professor Dana Thomsen^{1,4,6}

¹University of the Sunshine Coast, Sippy Downs, Australia. ²University of Western Australia, Perth, Australia. ³Future Earth Coasts, Brisbane, Australia. ⁴University of Waikato, Waikato, New Zealand. ⁵Lincoln University, Christchurch, New Zealand. ⁶Uppsala University, Uppsala, Sweden. ⁷Brock University, St. Catharines, Canada



Dr Carmen Elrick-Barr

Abstract

Coastal communities are situated in dynamic contexts at risk from the impacts of climate change and other hazards. Consequently, identifying and implementing meaningful strategies to maintain and/or improve wellbeing are more important than ever. Yet, coastal adaptation planning and management is often framed through a risk and/or vulnerability lens, and as such, it is unclear how perspectives on wellbeing contribute to adaptation decision-making.

To address this gap, we interviewed key stakeholders that respond to change (coastal managers) and seek to improve wellbeing (community service providers) in Australia's fastest growing coastal areas. We used Maslow's Hierarchy of Needs theory as a tool to examine perceptions of needs attainment as indicative of progress towards improved wellbeing.

We found that perceptions of inequity were consistent across sectors and communities, regardless of socio-economic determinants of wellbeing: highlighting a critical need for improved procedural justice in adaptation planning and management. Conversely, the impact of coastal hazards on community needs were perceived differently. Coastal managers perceived greater impacts on higher order needs (self-esteem and self-actualisation), while community service providers perceived greater impacts on lower order needs (physiological). Consequently, some needs may receive greater attention in coastal adaptation planning and management than others, based on core sectoral responsibilities and associated resourcing. In the absence of greater integration between sectors, the ability to improve or maintain wellbeing in coastal communities under a changing climate will be hampered.

Theme

Social & economic dimensions of adaptation

S06.3.3

Farmers' views on future climate and climate projections for decisions.

Dr Yuwan Malakar¹, Dr Aysha Fleming², Dr Stephen Snow¹, Dr Emma Jakku¹, Dr Simon Fielke¹

¹CSIRO, Brisbane, Australia. ²CSIRO, Hobart, Australia

Abstract

Climate change poses a risk to farmers. To help farmers manage future climate risks, multi-decadal climate projections are increasingly becoming available. This study explores how Australian farmers perceive climate risks and their likelihood of using multi-decadal climate services for future decision-making. Using My Climate View as an example, 51 farmers were interviewed across all states. We found that farmers' views on future climate risks varied, with some seeing it as favourable, stable, tolerable, or unfavourable. These perceptions influenced their expected future use of My Climate View. Farmers found My Climate View useful for understanding future climate trends, making strategic decisions, and planning long-term investments. However, actional decisions based on these projections were less common. Several barriers hindered the use of My Climate View, including: (a) lack of clarity in the science behind climate models; (b) gaps in relevant climate factors; (c) overwhelming data presentation without clear guidance; (d) limited commodity-specific information; and (e) concerns about negative impacts from others' decisions based on climate data. To improve adoption of multi-decadal climate services, this study suggests increasing scientific transparency, communicating uncertainties effectively, providing evidence of use cases, and integrating climate projections into business planning and farm succession discussions.

Theme

Tell it, talk it

S06.3.4

Exploring older adults risk perception and response to heatwave communications

Miss Ella Jackman¹, Ms Mehak Oberai¹, A/Prof Shannon Rutherford¹, Dr Aaron Bach², Dr Sebastian Binnewies¹, Mr Connor Forbes¹, Dr Steven Baker¹, Dr Zhiwei Xu²

¹Griffith University, Gold Coast, Australia. ²Griffith University, Brisbane, Australia



Miss Ella Jackman



Ms Mehak Oberai



A/Prof Shannon Rutherford



Dr Aaron Bach



Dr Sebastian Binnewies



Mr Connor Forbes



Dr Steven Baker



Dr Zhiwei Xu

Abstract

Older adults are among the most at-risk populations to the impacts of extreme heat due to physiological, medical and socioeconomic factors. However, research has shown their perception of heat risk is low, leading to delays in actioning heat protective behaviours. As Queensland is globally one of the most at-risk regions to high impact heatwaves due to climate change, there is an urgent need to bridge this gap through improved heatwave communications. During summer 2023, the Ethos Project engaged with older Queenslanders (>65 years) in a World Café setting exploring their perspectives on heat-health risks, their adaptive behaviours during hot weather, and their preferences for heatwave warning communication. Findings revealed low personal perceived risk of heat-health impacts, with many participants expressing concern for others they felt were more at risk than themselves. Participants voiced frustration with current warning systems, citing delays, miscommunication, and the perceived irrelevance of messages, alongside concerns about barriers such as the cost of cooling, retrofitting homes, and access to cool spaces during power outages.

Regarding heat risk perception and heatwave communications, these findings echo results from our 2022 statewide survey of this demographic (n=547). Only 43% of older Queenslanders recalled ever hearing a heatwave warning and less than half of those (49%) adopted protective actions in response. Further, despite 87% of survey respondents reporting to have a chronic health condition, only 20% felt that they were personally more at risk of heat than their peers. Though our World café findings are independent of our survey, together these findings demonstrate a gap in heat risk perception

among older Queenslanders and lack of response to heatwave communications. This presentation will unpack our World Café findings and explore how these insights can help to inform the design of heatwave communications, empowering older Queenslanders to protect their health during heatwaves.

Theme

Tell it, talk it

S06.3.5

The Behavioural Economics of Climate Adaptation

Dr German Puga^{1,2}, Professor Marit Kragt^{1,2,3}

¹Centre for Agricultural Economics and Development, University of Western Australia, Perth, Australia. ²Australian Research Council Training Centre for Behavioural Insights for Technology Adoption, Brisbane, Australia. ³Zero Net Emissions Agriculture Cooperative Research Centre, Perth, Australia

Abstract

Traditional economic models based on profit- and utility-maximisation theories may likely overestimate the degree to which economic agents adapt to climate change. We use behavioural economic theories and concepts to explain why.

While prospect theory suggests that agents' fear of losses could lead them to increase their adaptation efforts, it also suggests that agents prefer the status quo over adopting new climate adaptation practices. The endowment effect, effort justification, the sunk cost fallacy, and confirmation biases can further explain agents' reluctance to change current practices.

Excessive, difficult-to-digest information on climate change forecasts and the many potential adaptation strategies can lead to decision fatigue and, hence, lower adaptation efforts. The uncertainty surrounding this information can further decrease adaptation endeavours.

The present bias suggests that agents often prioritise immediate rewards (including inaction) over future ones at the expense of long-term benefits. This behaviour is in line with the concept of hyperbolic discounting, in which agents implicitly use a discount rate that declines over time, making climate adaptation less appealing.

We have identified close to 100 cognitive biases that can impact climate adaptation. Many of these biases relate to social capital and the perceptions that agents have about climate impacts and adaptation strategies. Policymakers, researchers, and consultants are also subject to these biases, which can lead them to overestimate the degree to which climate adaptation might occur.

Nonetheless, professionals working on climate adaptation can play huge role in increasing adaptation endeavours. They can achieve this by focussing on the priority adaptation strategies available and clearly communicating these in a way that leads to less uncertainty, emphasising the direct benefits of strategies. Professionals can also use (ethical) nudges to increase climate adaptation efforts.

Theme

Social & economic dimensions of adaptation

S06.3.6

A WA first - School Open Streets Success

Ms Leah Adams¹, Ms Danielle Stone²

¹City of Canning, Perth, Australia. ²Department of Transport, Perth, Australia



Ms Leah Adams



Ms Danielle Stone

Abstract

In Perth WA, school trips comprise of 18% peak morning car trips. Shifting these to walking, wheeling, and riding to school have the potential to lower greenhouse gas emissions, air pollutants and traffic congestion, as well as delivering a range of health and wellbeing benefits.

School Open Streets involve temporarily closing a street next to a school to vehicle traffic and opening the street to active travel, play and community connection during school drop off and pick up times. It is an innovative approach to adapt and reimagine the use of street space.

As part of the Armadale Line Active Travel Project and the Your Move program, the Department of Transport in collaboration with City of Canning trialled School Open Streets at two schools; Riverton Primary School and Queens Park Primary School.

This presentation will showcase this successful collaboration to deliver WA's first School Open Streets Trial, which aimed to improve safety, encourage more families to walk and ride to school and foster community connectedness.

The School Open Street Trial was co-designed with students and parents. and was undertaken over three days across a three-week period. Results from the trials indicated substantial increases in active travel without adding additional stress on the road network. 75% of parents said the trial made them more supportive of their children walking or riding to school. These results correlate with and build upon other successful deliveries in the United Kingdom and Merribeek City Council, Victoria.

The successful trial has led to the City of Canning investigating opportunities to continue implementing School Open Streets. The City is also undertaking further infrastructure improvements to support more walking and riding to schools, including road reviews, traffic calming, road treatments, tree planting, park and walk facilities and children's crossings.

Theme

Adaptation in practice

S06.4.1

The NSW CCROA: Systems analysis for strategic adaptation decision-making

Dr Bart Kellett¹, Mr Jordan Kiehne²

¹DCCEEW, Grafton, Australia. ²NSW DCCEEW, Sydney, Australia



Dr Bart Kellett



Mr Jordan Kiehne

Abstract

The NSW Climate Change Risk and Opportunity Assessment (CCROA) provides a robust evidence base for adaptation decision-making, leveraging systems thinking and analysis to describe the multifaceted nature of risks and opportunities. New understanding of the interplay between physical, transition, and liability risks and opportunities adds strategic context, making it unique compared with other assessments. Complexity was captured with systems maps and risk pathways, linking climate variables, hazards, impacts and responses.

This assessment combines hazards and actions to evaluate exposure across five regional NSW archetypes: Global City, Port City and Surrounds, Coastal Strip, Rural Heartland, and Remote West. The assessment incorporates diverse perspectives from various sectors, including government, technology, finance, retail, energy, and construction. Additionally, it integrates Aboriginal knowledge and insights from across NSW, adding nuance to dominant views about climate change.

An iterative analysis process was employed, encompassing literature reviews, data analysis, relationship mapping, and validation through interviews and workshops with subject matter experts. Governance structures were established to review the methodology and approve deliverables, ensuring the rigor and credibility of the assessment. Further, consultants with expertise across various subject areas and skill sets were procured to enhance the assessment's depth and breadth.

This holistic approach reveals complexity and underscores the importance of systems analysis in understanding and detailing climate change risks and opportunities, providing a strategic framework for future adaptation decision-making and investment.

Theme

Understanding & assessing hazards & risk

S06.4.2

Cascading risk archetypes – pushing the boundaries of risk assessments?

Dr Paula Blackett^{1,2}, Dr Tom Logan^{3,4}, Dr Mitchell Anderson³, Dr Andrew Allison⁵

¹Urban Intelligence, Hamilton, New Zealand. ²Waikato University, Hamilton, New Zealand. ³Urban Intelligence, Christchurch, New Zealand. ⁴University of Canterbury, Christchurch, New Zealand. ⁵Urban Intelligence, Auckland, New Zealand



Dr Paula Blackett

Abstract

Current climate change risk assessment practices tend to focus on the direct effects of a single hazard, completely missing the chain of cause-and-effect that hazard events (e.g., floods) or slow onset change (i.e., sea level rise) can trigger. We know from observation, experience and previous research that the impacts and implications of hazards will propagate as cascades across physical and human systems, moving across time and space. These impacts can compound and combine to generate new impacts and risks or exacerbate existing risks. This occurs because of the interdependencies between elements within coupled natural and socio-economic systems, and is the product of a shock to a complex system. However, these important interdependencies are not usually considered in a standard climate change risk assessment. Consequently, this leads to risk being underestimated, resulting in an inadequate adaptation response. For example, the isolation risk from transportation network disruption, significantly increases the expected burden from sea-level rise beyond what direct exposure assessments capture and can exacerbate distributional injustices.

In this presentation we explore how cascading risk archetypes could help support the next frontier in climate change risk assessments – accounting for indirect climate risks. We will present research from Aotearoa-New Zealand where we have established some ways to account for indirect risk and have developed several archetypes of cascading risk that we hypothesise could be generally applicable and simple enough to apply in a range of settings and scales.

Theme

Understanding & assessing hazards & risk

S06.4.3

Translating Climate Risk Research into Practice with a Digital Platform

Dr Tom Logan^{1,2}, Dr Mitchell Anderson¹

¹Urban Intelligence, Christchurch, New Zealand. ²University of Canterbury, Christchurch, New Zealand



Dr Mitchell Anderson

Abstract

Understanding climate and natural hazard risk has become essential for local government, infrastructure providers, communities, companies, and central government. However, current approaches often use inconsistent methods and inadequate data. With the complexity, uncertainty, and evolving nature of climate science, organizations struggle to coordinate responses, build community trust, and equitably allocate adaptation funding.

Our research addresses these challenges through developing an integrated climate and natural hazard risk platform now implemented with multiple councils across New Zealand. This dashboard supports asset management, adaptation planning, and community engagement by providing a consistent, accessible evidence base that considers both direct and indirect impacts across societal wellbeing domains (built, natural, social, cultural, economic, and governance).

The platform enables a "living" spatial risk assessment that updates with changing information and research understanding. However, this approach raises significant methodological challenges across risk disciplines, including: 1) integrating hazard data of varying quality and resolution; 2) assessing and communicating spatiotemporal uncertainty; 3) addressing ethical considerations around equity in both process and outcomes; and 4) maintaining consistency while accommodating local context.

Implementation across different regions has revealed that effective risk visualization must balance technical rigor with accessibility for diverse users. Councils report improved decision confidence and more productive community conversations when stakeholders share a common understanding of risk information. The emergence of cross-regional knowledge sharing represents an unexpected benefit, as organizations using similar methodologies collaborate on adaptation approaches.

While significant challenges remain in representing complex climate risks through digital interfaces, consequential adaptation decisions are already being made with far less sophisticated information. Our experience demonstrates that research-backed, interactive risk assessment tools can meaningfully improve climate adaptation planning when developed through sustained collaboration between researchers, practitioners, and communities.

Theme

Understanding & assessing hazards & risk

S06.4.4

Preparing councils for current and future climate impacts on assets

Mr Daniel Pleiter

SECCCA, Melbourne, Australia



Mr Daniel Pleiter

Abstract

The Asset Vulnerability Assessment Project, managed by the South East Councils Climate Change Alliance on behalf of their members, developed tools and approaches to support 9 councils, south east of Melbourne, to understand how council buildings, drainage and local road assets will be impacted by various climate scenarios. This included attributing a vulnerability rating to assets and identifying adaptation options that may increase asset resilience.

The project examined how climate change impacted expenditure on council assets through calculating the financial and economic cost of various adaptation options on several site-specific case studies. This information assists with appropriate budget forecasting to ensure ongoing delivery of services to the community.

This project was aimed at assisting councils to better understand how their buildings, roads, drainage and open space will be impacted by climate change and associated extreme weather events. More specifically, the project assisted councils to understand:

- how climate change impacts a particular asset
- how might service delivery be impacted by climate change
- how much extra will an asset or service cost to maintain or deliver assuming no adaptation action
- how much would be the expected cost of making assets resilient; and
- how might council income streams be impacted by climate change.

While the work to adequately manage council assets in a changing climate is ongoing the Asset Vulnerability Assessment Project provided the foundation for councils to embed new approaches within asset management planning. The project has led to similar work specifically focusing on enhancing community resilience and recently how to finance the large infrastructure projects outside of traditional methods.

Theme

Adaptation in practice

S06.4.5

Novel Risk Framework Informing Great Barrier Reef Adaptation Decisions

Mr Mayuran Sivapalan, Professor Paul Hardisty
Adaptus, Perth, Australia



Mr Mayuran Sivapalan



Professor Paul Hardisty

Abstract

Keywords: risk assessment, decision-making, climate adaptation, coral reefs, governance, infrastructure

Effective climate adaptation governance requires robust frameworks that translate complex modeling into actionable risk assessments. This presentation details an innovative, quantitative risk-based analysis that bridges this gap for the Great Barrier Reef (GBR), providing critical insights for adaptation decision-making.

Following AS/NZS ISO 31000:2018 risk standards, we developed a comprehensive framework that combines statistical likelihood with ecological and economic consequences across five climate scenarios. Unlike conventional qualitative assessments, our approach leverages ensemble modeling results (940 model runs) to classify likelihood based on the proportion of models projecting specific reef states, providing probability-based risk trajectories through 2100.

Our results reveal a clear acceleration of risk for the GBR, with ecological risk levels escalating rapidly from LOW in 2025 to HIGH by 2030 across all climate scenarios. By 2045, the most likely scenario (SSP2-4.5) reaches VERY HIGH ecological risk, with economic risks following a similar but delayed pattern.

This framework delivers several governance innovations: (1) transparent probability-based classification of risk that evolves over time rather than static assessments; (2) economic risk quantification that helps prioritise interventions based on value at risk; and (3) identification of critical intervention windows before ecological thresholds are crossed.

While developed for a natural asset, this methodology has broad applicability to physical infrastructure and built environments facing climate risks. The approach enables consistent evaluation of adaptation options across diverse assets, supporting robust decision-making under uncertainty. For all decision-makers, these dynamic risk trajectories provide a structured basis for adaptation planning, helping determine when, where, and how to implement interventions while highlighting rapidly closing opportunity windows for effective action.

Funding: This research was undertaken for the Reef Restoration and Adaptation Program, funded by the Australian Government's Reef Trust and the Great Barrier Reef Foundation.

Theme

Decisions & governance

S06.4.6

Spatial Disconnect: Climate Risk Assessment Failing Cities Globally

Dr Mitchell Anderson

Urban Intelligence, Christchurch, New Zealand



Dr Mitchell Anderson

Abstract

Climate adaptation is intrinsically spatial, yet many risk assessments fail to consider the explicit spatial nature and distribution of present and future impacts. This study presents a global examination of over 50 local climate risk assessments from diverse cities and communities worldwide, aiming to evaluate their effectiveness in supporting adaptation planning.

The research addresses critical challenges including interconnectedness, uncertainty, spatial and temporal variations, and adaptive capacity. Our evaluation criteria, derived from current literature, encompasses assessment credibility, scientific foundations, and legitimacy. These include consideration of societal value domains, relevant risk sources, scenarios and timeframes, geospatial analysis quality, risk science foundations, adaptive management approaches, uncertainty awareness, transparency, stakeholder engagement, and equity considerations.

Preliminary findings underscore varying degrees of consideration given to different societal domains and integration of contemporary risk science concepts. The research identifies significant gaps in the integration of relevant hazards, temporal aspects, and spatial resolutions in assessed risk scenarios.

Failing to provide fit-for-purpose risk assessments leaves adaptation planning practitioners ill-prepared to engage communities and make effective decisions. Inadequate assessments may lead to maladaptive interventions, exacerbated vulnerabilities, and significant social, economic, and environmental costs. Furthermore, loss of community trust in adaptation planning can hinder future intervention efforts. Our findings reinforce recent literature indicating that adaptation planning worldwide is unlikely to be effective without substantial improvements in spatially-informed approaches.

Theme

Understanding & assessing hazards & risk

S06.5.1

Insights on the Global Goal on Adaptation ahead COP30

A/Prof Johanna Nalau

Griffith University, Southport, Australia

Abstract

This presentation contributes to the international discussion and process on the Global Goal on Adaptation (GGA). The presentation engages with participants through two issues: 1. Understanding and evaluating the progress to date on the Global Goal; 2. The concept of transformational adaptation. Each topic will be addressed, followed by discussions about the linkages between global goals and transformational adaptation, entry points during and following COP30, and the practical implications for adaptation at different scales.

Part 1: Technical expert activities on the Global Goal on Adaptation (GGA): 76 technical experts were chosen to evaluate indicators and approaches to provide guidance to the negotiators who are expected to conclude the GGA at COP30. The presentation starts with unpacking the technical process of indicator work, how indicators have been developed and constructed, and how countries like Australia could evaluate their adaptation efforts. Expectations for the next steps at COP30 and in the UNFCCC context will be addressed.

Part 2: Transformational Adaptation in the UNFCCC and IPCC: Within the GGA workstream, increasing attention has been focused on transformational adaptation and how this concept could be integrated into existing UNFCCC spaces. To help inform these discussions, members of the GGA expert group have been working on operationalizing this concept, including understanding the different factors that may be included in this concept. This research focused on identifying these dimensions and foster agreement by drawing on the expert opinions from practitioners to negotiators. The presentation provides the scientific community with a space to further contribute to a research agenda that can support the GGA going forward.

Adaptfest Video Link

[I don't have a video](#)

Theme

Decisions & governance

S06.5.2

A method for tracking national progress towards climate change adaptation

Prof Jon Barnett¹, Ms Tia Brullo¹, Dr Elissa Waters², Dr Sarah Boulter³

¹The University of Melbourne, Parkville 3010, Australia. ²Monash University, Clayton, Australia. ³The University of Tasmania, Hobart, Australia

Abstract

Adaptation tracking is now an important means to characterise, report, and monitor progress towards reducing vulnerability to climate change. The means and methods for adaptation tracking are challenging and diverse due to differing purposes and sectors and scales of analysis, difficulties in classifying activities as adaptation of one kind or another, and challenges in defining and measuring progress. Here we report on the approach and method used to develop the Australian Adaptation Database. With 500 adaptation activities initially coded, the database is a repository for learning from the efforts of others, helps to track progress in adaptation activities across all sectors and scales in Australia, and helps responsible authorities to meet reporting obligations. The paper explains on an approach to assess progress in adaptation within and between sectors and jurisdictions. We conceive of progress as being a situation where adaptation activities evolve towards interventions that affect change, and to this end we propose a typology of progress against which adaptation activities can be classified. Though the nature of adaptation makes all such exercises imperfect, the result, we propose, is a framework and method that serves the purposes of characterising, reporting, and monitoring progress towards adaptation within a country.

Theme

Decisions & governance

S06.5.3

From Planning to Practice: Empirical Insights on Adaptation Progress and Governance Roles in Australia

Ms Tia Brullo¹, Prof Jon Barnett¹, Assoc. Prof Sarah Boulter², [Dr Elissa Waters](#)³

¹The University of Melbourne, Melbourne, Australia. ²University of Tasmania, Hobart, Australia. ³Monash University, Melbourne, Australia



Ms Tia Brullo

Abstract

Despite widespread recognition of the importance of governance in enabling climate adaptation, we still lack systematic, empirical analysis of how adaptation responsibilities are distributed and how that maps onto actual progress. This presentation draws on the newly released Australian Adaptation Database to address that gap, presenting a national overview of over 600 adaptation policies, strategies, and actions.

Through analysis of adaptation activity across levels of government, the presentation identifies where progress is occurring in planning, capacity building and implementation and how these stages vary by jurisdiction and governance scale. It also examines how formal and informal responsibilities for adaptation are shifting in response to policy change, funding arrangements, and climate impacts.

By combining empirical data with a governance lens, this presentation offers new insights into how adaptation responsibilities are being operationalised across jurisdictions. It highlights key implications for coordination, equity, and the resourcing of implementation, contributing to a clearer understanding of the conditions that enable progress from planning to action.

Theme

Decisions & governance

S06.5.4

Developing a climate strategy for landscapes – challenges and learnings

Mrs Eilidh Wilson, Mrs Marcela Rosero

Murraylands and Riverland Landscape Board, Murray Bridge, Australia



Mrs Eilidh Wilson



Mrs Marcela Rosero

Abstract

Understanding how one organisation is implementing adaptation and mitigation actions across a large landscape of diverse habitats and land uses is no small feat. The Murraylands and Riverland Landscape Board introduce a methodology to capture current adaptation and mitigation actions, while building the capacity and knowledge of staff to understand future? climate change impacts. The process has identified knowledge gaps and opportunities for program areas, providing a pathway to assess the effectiveness of current actions into the future. This enables the landscape board to make decisions about project outcomes and their suitability for projected climate changes by 2050. Connecting the climate change strategy to the landscape board's Regional Landscape Plan is integral to the process, providing a framework that support the plan priorities and clearly articulate current actions. Resulting in the board being well positioned to regularly audit these actions and to prioritise future actions for funding with partners.

Theme

Decisions & governance

S06.5.5

Enviro Pulse - NSW households' capacity to adapt to climate change

Ms Mari Jaervis

NSW Department of Climate Change, Energy, the Environment and Water, Sydney, Australia



Ms Mari Jaervis

Abstract

Enviro Pulse survey insights on NSW households' capacity to adapt to climate change

For government policy and programs to be effective in helping communities to adapt to climate change we need to understand the factors that help or impede people in becoming more adaptive and resilient to the changing climate.

Since 2020, the NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) produces the Enviro Pulse - a quarterly survey to gauge NSW residents' environmental attitudes and behaviours, including their experience of severe weather events. The original questions now have four years of corresponding trend data, forming a unique resource to monitor trends over time.

With the establishment of the NSW Climate Change Adaptation Strategy in 2022, there was a new priority to develop robust and trusted metrics to monitor progress towards climate change resilience and adaptation in NSW. In response, a review of the literature and an assessment of thematic gaps in the Enviro Pulse survey was undertaken at DCCEEW. This informed the design of new survey questions for the Enviro Pulse that enable the Strategy metrics framework to track NSW community capacity to cope with and adapt to climate change.

This presentation reports on what concepts and data were found to be important to support policy and programs to measure NSW households' experiences of and responses to climate change. We will discuss the frameworks and literature that helped inform the work, and the balance negotiated between comparability and usability of data for end-users. Enviro Pulse results will be presented to demonstrate how 'everyday' people are perceiving and responding to climate threats in NSW. The purpose-built dataset helps to understand how this varies by socio-economic factors or assets such as climate resilient housing and social networks.

Enviro Pulse is funded under the NSW Governments Climate Change Adaptation Strategy.

Theme

Social & economic dimensions of adaptation

S07.1

Creative Engagement for Adaptation – (Outdoor Walking Session) Practice and Reflection

Dr Kathleen Broderick¹, Dr Anne Leitch²

¹Australian National University, Canberra, Australia. ²Griffith University, Gold Coast, Australia

Abstract

The work of those involved in community engagement is as much art as science and designing engagement must reflect the local context. While undertaking a review of the CoastAdapt community engagement manual, local government managers, consultants and academics across Australia and New Zealand shared their experiences and expertise. This process revealed stories and case studies of exemplary practice that will provide inspiration to novice and experienced coastal managers alike.

Adopting a social learning approach and working through a six-step cycle will enable strategic action. But that's just the mechanics of it. Adopting a creative approach to design of engagement processes and actions, engaging with current community leaders and activities, planning for and communicating a variety of opportunities for consultation throughout the adaptation journey, and ensuring the process engages both with 'rationality and human emotions and feelings' (Coyne 2005) will deliver powerful results. Deliberately seeking opportunities for participants to express challenging concepts and values creatively can engage and provide meaningful interaction.

It is important to see coastal adaptation as part of complex systems change where progress is not necessarily linear, requires viewing both social and coastal systems as an integrated whole and creatively exploring opportunities for change.

Theme

Tell it, talk it

S07.2.2

Funding Climate Adaptation: Challenges and opportunities from Benefit Distribution Analysis

Miss Sarah Leck¹, Mr Martijn Gough²

¹Ricardo, Perth, Australia. ²Ricardo, Melbourne, Australia

Abstract

Adaptation to the impacts of climate change, requires significant and ongoing investment in a range of protection measures. However, securing the right funding for adaptation is complex due to the diverse range of beneficiaries, including different levels of government, private landowners, businesses, and communities. Each has varying degrees of responsibility, financial capacity, and willingness to pay, making it difficult to develop equitable and widely accepted funding models. Without a clear and equitable funding model, adaptation projects risk being delayed, underfunded, or left incomplete.

A major barrier to funding models is the lack of clear, evidence-based justification for cost-sharing arrangements. Public authorities often struggle to demonstrate the value of adaptation beyond protecting local assets and private property. Economic analysis plays a critical role in addressing this gap by quantifying the broader benefits of adaptation, including economic resilience, public safety, and environmental protection. By determining the economic value of adaptation, decision-makers can develop funding models that fairly distribute costs while securing long-term financial commitments. This requires collaboration across public and private sectors, with a clear understanding of adaptation benefits. However, many existing funding models fail to account for wider benefits, making it difficult to justify shared financial responsibility.

Benefit distribution analysis (BDA) can inform funding models that distribute the costs of adaptation equitably across beneficiaries. BDA relies on sound economic analysis to demonstrate the distribution of benefits from adaptation. Few BDA and related funding models have been completed to date. Ricardo has worked with several local governments to undertake BDA for coastal protection measures. This work has provided insights into the challenges in undertaking BDA and economic analysis of adaptation options more broadly.

This presentation will outline best practices for integrating economic analysis and BDA into funding models, emphasizing simplicity, efficiency and transparency to align stakeholder interests and ensure sustained investment.

Theme

Decisions & governance

S07.2.3

Building capabilities for systemic resilience investment

Ms Melinda Morris, Mr Simon Bradshaw
Climate-KIC Australia, Sydney, Australia

Abstract

As climate change intensifies, its impacts on economies, nature, and communities continue to rise. Despite growing recognition of the need to build resilience, there remains a substantial funding shortfall for effective solutions.

The Resilient Futures Investment Roundtable is a coalition of public, private, research and not-for-profit organisations working to address this gap by developing resources to improve decisions around when, where and how to invest in resilience. This includes developing guidance to support organisations to develop a strong business case for climate and disaster resilience investment, recognising the systemic and cascading nature of climate and disaster risk.

Traditional siloed interventions often fail to address the complex, systemic nature of climate risks. This paper introduces the ABCD framework as a conceptual pathway for decision-makers to adopt a systemic lens in building investment cases for resilience action. By making systems thinking more accessible and actionable, the guidance aims to increase funding for projects that protect vulnerable communities.

The framework outlines four progressive stages:

Stage A: Values avoided losses for single assets by incorporating future climate risks into cost-benefit analysis.

Stage B: Expands to include co-benefits across social, environmental, and economic domains.

Stage C: Emphasises coordination and diversification, valuing synergies, stacked benefits, and enhanced adaptive capacities through cross-sectoral collaboration.

Stage D: Envisions an integrated systemic approach that maximizes value and unlocks emergent opportunities through a long-term, transformative vision.

By progressing through these stages, organisations can develop a deeper understanding of interconnected systems, identify a broader range of benefits, and ultimately build more robust and compelling business cases for resilience investments and foster broad collaborations that align with the interconnected nature of climate impacts and resilience solutions. This framework supports a shift from reactive measures to proactive, sustainable solutions that address the root causes of climate vulnerability, fostering resilient futures for communities and economies.

Theme

Social & economic dimensions of adaptation

S07.2.4

Supporting climate risk management and adaptation among Queensland's SMEs

MS DOREAN ERHART¹, MS CATIE SIMMONS²

¹LINDEN CLIMATE ADVISORY, BRISBANE, Australia. ²BUSINESS CHAMBER QUEENSLAND, BRISBANE, Australia



MS DOREAN ERHART



MS CATIE SIMMONS

Abstract

Queensland small and medium enterprises (SMEs) comprise 99% of all businesses and employ 70% of the state's workforce – they are the backbone of the economy and heartbeat of the community.

Their ability to successfully navigate climate-related risks is crucial not only for their survival but for Queensland's broader social and economic stability.

Research by Business Chamber Queensland reveals 61% of SMEs operate at basic sustainability levels despite being motivated to improve. Improving business maturity in climate risk management can strengthen resilience against climate impacts and help capitalise on emerging opportunities in changing markets and regulatory landscapes – realising improved business confidence.

Business Chamber Queensland is a trusted peak body representing and supporting all Queensland businesses. For over 11 years, Business Chamber Queensland has partnered with the Queensland Government to deliver the ecoBiz program, which helps businesses build sustainability maturity through a theory of change approach. The program has evolved through digital scaling and expansion of module offerings.

In 2024 Business Chamber Queensland developed a digital 'Climate Risk & Adaptation' module to help SMEs:

- Understand climate change and related climate risks
- Improve decision-making and resilience
- Integrate climate risk planning into business as usual
- Prepare for climate-related financial disclosure requirements
- Reduce future costs

This ambitious offering – an Australian first – features interactive tools and tailored learning, delivered through a five-step user experience:

1. Climate risk maturity assessment
2. Learning articles (selected by maturity level)
3. Climate risk & opportunities assessment tool
4. Action plan tool
5. Implementation dashboard

Launched in April 2025, the module represents a collaboration between Business Chamber Queensland (SME expertise), Linden Climate Advisory (climate risk expertise), and IT Blueprint (digital design), with Queensland Government funding.

Our presentation will outline project objectives and program logic, detail each module component, and share outcomes including user metrics and feedback.

Theme

Social & economic dimensions of adaptation

S07.2.5

Infrastructure Resilience - Integrating Adaptation into Budgeting and Investment

Mr Michael Nolan

Aurecon, Melbourne, Australia



Mr Michael Nolan

Abstract

Increasing the climate resilience of infrastructure and assets requires integration with existing budget development processes for government agencies. This presentation will cover several leading examples of resilient investment including: New Zealand national transport budget investment scenarios; Resource, Agri-Business and Retail sectors investments; and UN Disaster Risk Reduction - Resilient Infrastructure Scorecard related investment cases.

The presentation will also share insights from tackling investor challenges related to third party climate risks that are outside the boundary of assets but are responsible for significant financial losses. In initiating and facilitating partnerships between parties with shared climate risk, new investment opportunities and shared funding allocation have increased flow of capital and implementation action.

The presenter has worked in climate adaptation and resilience for over 20 years in 20 nations and will also share some practitioner insights regarding the advancement of adaptation decision making.

Theme

Decisions & governance

S07.2.6

Capacitating the garment-industry workers of Bangladesh for enhanced climate adaptation.

Ms Maliha Momotaj Himu, Ms Afsara Binte Mirza, Ms Mahzabeen Mahfuz
International Center for Climate Change and Development, Dhaka, Bangladesh



Ms Maliha Momotaj Himu



Ms Afsara Binte Mirza



Ms Mahzabeen Mahfuz

Abstract

Heatwaves is becoming more frequent and intense, particularly between May and July, posing new concerns for over four million workers in Bangladesh's ready-made garment (RMG) sector. Rising temperatures, erratic rainfall causing waterlogging paired with poor working conditions, have had a negative influence on workers' health, productivity, and overall well-being. In the light of this the International Center for Climate Change and Development, ICCCAD- based in Bangladesh, with the funding support of Laudes Foundation, is implementing a 3.5 year grant. The project aims to capacitate the RMG sector's workers from different tiers of the factories on the nexus of climate change and labour rights to improve the worker' climate adaptive capacities.

This initiative will particularly co-develop and deliver a context-specific training module for the garment workers and the management by incorporating diverse viewpoints of workers, employers, trade unions, labour rights organizations, NGOs, INGO, buyers and brands, government ministries, civil society bodies, etc.

The presentation will look at the following components of the project activities:

- Share feasible stakeholder mapping strategies helping to initiate adaptation measures for the garment workers to improve their working condition, strengthen their bargaining power and accessing adaptation technologies during heatwaves and other climatic stressors.
- Content of the context-specific climate change training module: the presentation will highlight the interactive components (theater, art, group discussion) content climate adaptation training tailored for RMG workers while addressing governance and policy barriers that hinder progress.
- Photo story: photo stories will be shared of a RMG worker emphasizing their lived realities amidst climate crises.

Key takeaways will underscore the urgency of integrating just transition, labor rights, and climate adaptation within social, economic, and policy frameworks to build a resilient and equitable RMG sector. The presentation will also stress the need for multi-stakeholder collaboration and inclusive social dialogue to protect workers' rights amid climate change.

Theme

Social & economic dimensions of adaptation

S07.3.1

Nature and People Together: A Vision for the World's Cities

Dr Sheryn Pitman

Green Adelaide, Department for Environment and Water, Adelaide, Australia



Dr Sheryn Pitman

Abstract

Adelaide joined the international family of National Park Cities in 2021 - the second National Park City in the world after London. This means a commitment to creating cities that are rich with nature, inspired by the relationships we have with nature in national parks.

This has led to wonderful opportunities for bringing people and nature closer together, for inspiring collaborations locally and internationally, and for building capacity and resilience in addressing the challenges facing cities.

Being a National Park City provides a springboard to engage with more people, share stories, address inequities, be more inclusive and work more closely with First Nations people. It is a catalyst for highlighting the benefits of urban nature and living infrastructure, and for addressing the climatic, health, economic, aesthetic, biodiversity and sense-of-place benefits of nature in cities.

Cities, now our primary human habitats, need a new vision. Around the world city leaders are recognising that nature-based solutions are critical to planning for climate change, restoring functional ecosystems, improving environmental health, and improving human health - social, physical, cultural, mental and spiritual. We understand the value of science, technology and innovation; now we increasingly understand and appreciate the critical value of nature in cities.

The National Park City story in Adelaide is about opportunities to bring people on the often-challenging journey towards more liveable, sustainable and empowered communities. Nature-based solutions are many and varied, and may include healthy green and blue space, tree canopy, wildlife habitat, water- and biodiversity-sensitive urban design, improved natural resource management and maintenance practices, innovative technologies, and nourishing connections between our social and natural landscapes.

Together these provide the foundation for healthy cities of the future. Restoring, creating and sustaining healthy and biodiverse natural assets along with engaged communities provides our cities with the greatest opportunity for adapting to a changing climate.

Theme

Adaptation for natural systems, natural systems for adaptation

S07.3.2

Water sensitive design: protecting natural systems and enabling climate-resilient communities

Ms Shelley Shepherd
Urbaqua, WA, Australia



Ms Shelley Shepherd

Abstract

Water Sensitive Urban Design (WSUD) is a holistic approach to urban planning that integrates water management into the built environment to support ecological integrity, enhance urban liveability, and strengthen climate resilience. As cities face increasing pressures from climate change, including extreme weather events, rising temperatures, and urban flooding, WSUD provides innovative solutions to protect and restore natural systems while fostering sustainable development.

This presentation explores the role of WSUD in safeguarding waterways, wetlands, and green spaces by mimicking natural hydrological processes. Strategies such as permeable surfaces, green infrastructure, stormwater harvesting, and biofiltration not only improve water quality but also sustain biodiversity and enhance habitat connectivity. By reducing urban runoff and mitigating pollution, WSUD helps to maintain the health of rivers, lakes, and estuaries, contributing to broader environmental conservation goals.

Beyond environmental benefits, WSUD is a key enabler in building climate-resilient communities. By incorporating nature-based solutions such as rain gardens, urban forests, and constructed wetlands, WSUD enhances thermal comfort, reduces urban heat island effects, and supports adaptive capacity in the face of climate variability. Additionally, integrated water management strategies ensure more efficient use of water resources, reducing demand on potable water supplies and increasing local water security.

Through case studies and practical examples, this presentation will highlight how WSUD can be embedded in urban planning frameworks to deliver long-term social, economic, and environmental benefits. By bridging the gap between urban development and ecological sustainability, WSUD represents a transformative approach to designing cities that are not only more liveable but also better prepared for future climate challenges.

Theme

Adaptation for natural systems, natural systems for adaptation

S07.3.3

Safeguarding Nature's Safeguards: Climate Risks to Western Australian Carbon Sinks

Mr Johnny Machon

Department of Primary Industries and Regional Development, Perth, Australia



Mr Johnny Machon

Abstract

Western Australia's diverse landscapes include critical carbon sinks that provide a number of ecosystem services, including climate change mitigation. However, the management of potential carbon sinks, such as vegetation and soils, faces a catch-22: while the existence and function of these natural capital assets play an important role in mitigating greenhouse gas emissions, they are themselves threatened by climate change, potentially reducing their capacity to sequester and retain carbon under some climate scenarios. This presentation examines this critical relationship and its implications for Western Australia, including the state's primary industries.

Emerging research has identified risks to carbon sinks across multiple climate scenarios. Even today, natural carbon sinks are under pressure from increasing bushfire frequency, heat stress, altered rainfall patterns and climate variability. Under moderate and higher global warming scenarios, these impacts intensify by mid-century and risk contributing to the acceleration of global carbon-cycle feedbacks. A significant share of Western Australia's carbon sinks is managed by primary producers, who face several coinciding adaptation challenges, complicating an effective response.

Significant knowledge gaps exist in our understanding of carbon dynamics across Western Australia's diverse regions. Current models inadequately capture spatial variations in sequestration potentials and risks. Without improved regional data and climate-sensitive carbon modelling, developing targeted adaptation strategies to protect these systems will remain extremely challenging, placing both carbon sinks and associated services at risk.

This presentation synthesizes current and emerging research to highlight the need for adaptation planning that addresses the vulnerability of carbon sinks. Protecting these natural safeguards, which draw down an important part of the footprint of human activities, requires dedicated research, enhanced monitoring and measurement, and integration of management strategies into broader adaptation frameworks for primary industries. Failure to integrate carbon sinks into adaptation planning may exacerbate the climate-carbon catch-22 with profound implications for regional and global climate resilience.

Theme

Adaptation for natural systems, natural systems for adaptation

S07.3.4

Future-proofing our urban forest through coordinated action

Ms Alison Collins

Department for Infrastructure and Transport, Adelaide, Australia



Ms Alison Collins

Abstract

Metropolitan Adelaide has its first [Urban Greening Strategy](#) to increase tree canopy, cool urban areas and boost biodiversity. This innovative, cross-sector strategy was released in March 2025, after 2 years of extensive engagement and investigation.

The Strategy seeks to bring together state government, councils, non-government organisations, industry peak bodies, research institutions, Koorana people and the broader community to achieve a more resilient and liveable city by 2055.

Climate change is already impacting the sustainability of Adelaide's urban forest, which is largely comprised of a small number of plant families with varying tolerances to the projected warming and drying. It will be important to increase the diversity of our urban forest to improve climate-resilience, as well as ensure adequate water is available to support sustainable growth.

Improving biodiversity in urban places is also imperative as the climate crisis intensifies. Cities are increasingly recognised for their important role in supporting biodiversity. Therefore, this strategy will drive the uptake of Biodiversity Sensitive Urban Design which aims to create built environments that make a positive, on-site contribution to biodiversity while meeting other urban greening or development outcomes.

This strategy establishes a consistent and shared monitoring approach across Adelaide to increase efficiencies and provide optimal data for tracking progress towards its 30% urban tree canopy target. Additionally, the strategy sets 2 performance investigation areas: reducing urban heat and improving plant species diversity.

This strategy provides a mechanism for government and non-government partners to work together to achieve more, by enabling projects that share the load and bridge the gaps between jurisdictions. By joining forces – having shared priorities and delivering complementary activities – we will grow our tree canopy.

This presentation will share learnings about how to bring government and non-government partners together to drive coordinated practical and affordable actions to create leafier and cooler neighbourhoods.

Theme

Adaptation for natural systems, natural systems for adaptation

S07.3.5

Building Climate Resilience in Urban Waterways: Saltwater Creek Catchment Strategy

Dr David Rissik¹, Ms Sophie Barrett², Dr Ingrid Baker³, Ms Sri Leach², Mr Fraser Ramsay³, Mr David Ryan²

¹BMT, Sydney, Australia. ²Cairns Regional Council, Cairns, Australia. ³BMT, Brisbane, Australia

Abstract

Saltwater Creek, a tidal waterway north of Cairns' Central Business District, is a vital urban ecosystem supporting residential communities, public spaces, and remnant natural habitats. However, creek modification, successive land use changes, and urbanisation over the past 40-50 years have exacerbated vulnerability to extreme events, which together with the direct and compounding effects of climate change threaten its health, function, and resilience.

We have worked with a range of stakeholders to develop a vision for a thriving, resilient, and climate-adaptive urban waterway. This underpins a plan addressing key challenges such as urban heat island effects, where increasing impervious surfaces contribute to rising temperatures in a city already projected to experience more extreme heat events. Flooding and stormwater management are also central concerns, with heavy rainfall and cyclones requiring major infrastructure interventions such as the Saltwater Creek Flood Resilience Project. Meanwhile, water quality and ecosystem health are compromised by urban runoff, necessitating monitoring programs like the Smart Catchment: Saltwater Creek initiative. Additionally, sea-level rise and coastal erosion threaten infrastructure and biodiversity, requiring adaptive responses.

To tackle these challenges, the Master Plan prioritises nature-based solutions, urban greening, and climate-sensitive design. Strategies such as tree planting, creek, riparian strip and wetland restoration, and enhanced community involvement aim to improve biodiversity, reducing impermeable surfaces, and urban cooling. Collaboration between Cairns Regional Council, James Cook University, OzFish, and First Nations partners—including the Gimuy Walubara Yidinji and Yirrganyndji—ensures that local knowledge and citizen science play a role in long-term stewardship.

This presentation will explore how an integrated, multi-stakeholder approach is shaping Saltwater Creek into a model for urban resilience, where ecosystems and communities thrive together in the face of climate change.

Theme

Cities, settlements & infrastructure

S07.3.6

Adapting ACT conservation policy, science and management to climate change

Ms Carla Alexandra¹, Dr Rosie Cooney¹, Mr Luke Grimshaw²

¹EPSDD Office of Nature Conservation, ACT Government, Canberra, Australia. ²EPSDD Parks and Conservation Services, ACT Government, Canberra, Australia



Ms Carla Alexandra



Dr Rosie Cooney



Mr Luke Grimshaw

Abstract

Climate change is increasingly re-shaping our ecosystems and society, with the scale and pace of change expected to accelerate in coming decades. Drought, heatwaves, high precipitation events and bushfire risks are all set to escalate. Nationally, many species are already shifting their ranges. Bushfire frequency is already causing changes to community composition and vegetation structure in ACT forests. The impacts of climate change pose far-reaching and unprecedented challenges for decision-making and planning at every level in the environment context. While there is considerable uncertainty around how climate change will impact different aspects of nature, it is essential that we act now to anticipate and prepare for change.

During this session, we will present an initiative working to adapt conservation in the ACT to a changing climate. We will present a range of approaches being applied in the Climate Adaptation for Nature Initiative, including how we are working with the social and institutional dimensions of embedding adaptation into conservation policy, science and management. The approach brings together three methodologies – adaptation pathways, Resist-Accept-Direct framework, and disaster resilience. Our approach has been working with a multiplicity of stakeholders with diverse and- sometimes divergent – values, and a highly complex legislative and policy framework.

The presentation will share key insights and novel findings from the past four years of implementing this approach. We highlight that future nature conservation efforts need to focus on preserving values that can be maintained *while* accommodating significant ecological change. Key insights include: **1)** integrating adaptation principles into conservation, **2)** taking a forward-facing approach to policy & strategy development, and **3)** climate adaptation mainstreaming, to work towards a conservation approach that is continually learning and dynamic to accommodate uncertainty, integrate new knowledge, and adjust to cope with rapid shifts in climatic, ecological, and socioeconomic conditions.

Theme

Adaptation for natural systems, natural systems for adaptation

S07.4.1

City of Canning - A Riverine City

Ms Rachel Williams, Mr Gary McCullough
City of Canning, Perth, Australia



Ms Rachel Williams



Mr Gary McCullough

Abstract

'New' public open space in the local government domain is rare. Particularly within the Canning City Centre, a Strategic Metropolitan Centre which can accommodate 10,000 new homes for up to 25,000 residents over the next 30 years. Reimagining infrastructure as green assets redefines the future of infrastructure in Western Australia.

The Canning City Centre developed a vision of a Riverine City, promoting the importance of high-quality blue-green infrastructure linking the newly elevated rail and station to the Canning River, an unseen oasis for Perth. By advancing the pedestrian experience, the city is reimagining roads and drains as green assets, transforming what are hot, dry unattractive sites into cool, green welcoming spaces. This urban regeneration is prioritising urban greening and biodiversity, improving water quality, the inclusion of art, and providing urban cooling outcomes.

Water Sensitive Urban Design features provide passive watering opportunities to reduce the reliance on traditional methods, and improved resilience to localised flooding. By opening community access to previously inaccessible spaces, we are addressing concerns around open space deficiency to provide the local community with places to recreate, enhancing opportunities to connect with people and nature, and facilitating physical activities that promote community health and wellbeing.

Three major projects delivered within the Canning City Centre that contribute to the Riverine City Vision include:

- Wharf Street Next Generation Community Park – Unlocking the potential of a fenced-off drainage basin into a multipurpose space that embraces liveability, sustainability, and productivity
- Lake Street Urban Stream – transforming an unloved engineered and fenced-off drainage ditch into a beautiful linear park connecting public transport hubs with retail areas
- Cecil Avenue – reimagining a road as green infrastructure, designed as a place for people rather than just cars

By reimagining how we deliver infrastructure in the Canning City Centre, we are creating a climate-resilient City for future generations.

Theme

Cities, settlements & infrastructure

S07.4.2

Sustainable Gosnells 2025

Mr Martyn Glover¹, Ms Sinead Bullock²

¹Curtin University, Perth, Australia. ²City of Gosnells, Perth, Australia



Mr Martyn Glover

Abstract

Theme: Cities, settlements and infrastructure

Title: Sustainable Gosnells 2025

Type: Oral Presentation

Presenter: Martyn Glover (Director Infrastructure, City of Gosnells)

In February 2023, the City of Gosnells adopted its Sustainability Action Plan: Sustainability in Action. The document established a series of 122 actions across the areas of biodiversity, climate, energy, infrastructure, transport, waste and water to minimise its environmental impact and to maintain and enhance existing environmental assets.

By taking such actions, the City supports a vibrant and sustainable community for the enjoyment of current and future generations. The City's sustainability priorities are to:

- Aim for net zero corporate emissions
- Reduce waste and promote a circular economy
- Source environmentally responsible goods and services
- Support the community and local businesses to reduce emissions

The City's aim for net zero corporate emissions means that the amount of greenhouse gases being released as a result of the City's activities are equal to those being removed from the atmosphere. The best way to do this is to reduce corporate emissions. The actions identified in the plan show how the City will progress towards a sustainable future by:

- Reducing energy consumption
- Switching to renewable energy sources
- Improving its natural environment

The City tracks the progress of this plan by reporting on the success of the actions and monitoring corporate emissions on an annual basis. The presentation will demonstrate the City's success over the past two short years since the plan was adopted.

Theme

Cities, settlements & infrastructure

S07.4.4

Local government climate practice - what has been learnt from inside

Ms Katrina Graham

NTARC, Hobart, Australia

Abstract

This presentation unpacks over 25 years of deep immersive local government climate practice and lived practitioner experience of the transition of action from mitigation through to adaptation. This is the untold story from inside – the one that is muttered in corridors and shared around water coolers, however, does not make it out of the building and to the community beyond. It is the warts and all, the best bits and the other bits that lurk out of sight.

Set against the challenges of a vacant and evolving policy landscape, combined with institutional structural challenges that preclude integrated and strategic action, the drivers of climate action are examined. They are considered through the prism of how climate action intersects with the day-to-day functioning and realities of organizations that are established to deliver jurisdictional responsibilities that are inherently reactive and prescriptive against emerging and novel climates.

It is recognized Australia-wide that local government has a significant role in responding to climate hazards and disasters.

Inherently councils appreciate the challenges faced from extreme and increasing climate hazard such as heatwaves, bushfires, floods and droughts; and their responsibility to act. Intrinsically they understand that impacts extend across municipalities and must be addressed collectively to ensure that their councils, strategically and operationally, including the millions of dollars of assets they are responsible for; and their communities, are climate ready and resilient.

Yet challenges still exist: their climate roles are unclear and not well understood; increasing service delivery demands and expectations are outside of their remit; climate action is a variable and contested spaces; and the need support i.e. funding, collaboration, legislation and systems thinking. Whilst these challenges are unresolved their responses remain ad hoc, discretionary and maladaptive resulting in uneven support and action across communities, rather than strategic and jurisdictionally aligned supporting thriving resilient communities.

Theme

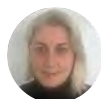
Adaptation in practice

S07.4.5

Newly launched CoastAdapt: refreshed and updated resources for coastal decision-makers

Ms Anne Leitch¹, Prof Brendan Mackey¹, Assoc Prof Sarah Boulter²

¹Griffith University, Gold Coast, Australia. ²NESP Climate Systems, Tasmania, Australia



Ms Anne Leitch

Abstract

CoastAdapt is a national web-based platform that provides information and decision support for addressing climate change risks and responses in Australia's coastal zones. It is designed to serve a wide range of coastal decision-makers, including local governments, businesses, industry groups, and communities.

Funded by the Australian government, CoastAdapt underwent a major revision from 2023 to 2025, informed by extensive consultation with coastal decision-makers. The goal was to better understand contemporary challenges and ensure the platform meets current information needs. This paper outlines these challenges and how CoastAdapt's resources can assist. It also highlights key updates and new content added to the platform.

The updated CoastAdapt features climate projections based on the IPCC's Sixth Assessment Report (AR6), along with new case studies and enhancements to the Coastal Climate Adaptation Decision Support tool (C-CADS). The platform covers broader topics critical to coastal resilience, such as Indigenous engagement, cascading and compounding hazards, creative approaches, just and fair adaptation, and climate anxiety. It also addresses emerging issues like blue carbon opportunities and additional stressors including plastics, light, noise, dogs on beaches and driving on beaches. Practical guidance is also provided on maximising value from use of consultants, broad stakeholder engagement, legal risk, land use planning and securing organizational buy-in.

The update includes new engagement tools and insights from best practices. CoastAdapt now offers case studies across 14 interdisciplinary topics, such as infrastructure planning, coastal planning and governance, community engagement, coastal tourism, dealing with contaminated land and disaster waste, and supporting coastal industries to adapt and nature-based strategies.

This refresh ensures coastal decision-makers have access to the latest data, case studies, and adaptation options, enhancing their capacity for effective planning and implementation. Additionally, the new decision support platform, Adapt Land&Sea, complements CoastAdapt by focusing on biodiversity and climate change decision-making.

Theme

Adaptation in practice

S07.4.6

How statewide hotspot hazard assessments have guided WA coastal adaptation

Ms Lucya Roncevich, Mr Tim Stead, Dr Fangjun Li
Department of Transport, Fremantle, Australia

Abstract

Over the past decade the WA state government has undertaken state-wide hazard assessments of coastal erosion and coastal inundation risk to identify hotspots.

By undertaking these studies DoT and DPLH have been able to strategically facilitate adaption at these sites through a range of different approaches under CoastWA, which has ultimately led to a reduction in exposure to coastal hazards at some locations.

A few case studies will be considered to demonstrate this in action.

Theme

Adaptation in practice

S07.5.1

Enhancing National Hazard Resilience: Open-Access Flood Risk Data for Australia

Ms Annmarie Mabarrack¹, Ms Jessica Keyzers²

¹FrontierSI, Adelaide, Australia. ²FrontierSI, Melbourne, Australia



Ms Annmarie Mabarrack



Ms Jessica Keyzers

Abstract

Challenge

Australia has experienced several major floods in recent years. The 2022 Eastern Australia floods were among the most catastrophic, affecting New South Wales and Queensland. Heavy rainfall submerged homes and businesses, leading to the evacuation of thousands of people and billions of dollars in economic losses. The event prompted discussions about urban resilience and flood mitigation strategies. At a national scale there is a gap in how to accurately determine the quantitative impacts of how many residential properties are at risk from future flood events. A lot of data exists but it is locked up in expensive license models and can't be taken full advantage of.

Currently Geoscience Australia is establishing an ongoing commonwealth capability to deliver solutions for national multi-hazard extent, exposure and impact services. FrontierSI are working with Geoscience Australia on new ways to produce the data using the latest technology and innovative methods along with existing open data.

Solution

The aims of the project are to produce an open-access information asset that quantifies floor heights for residential buildings at a national scale in known high flood hazard areas from remotely sensed data sources, and to develop a scalable and repeatable pattern leveraging machine learning techniques that can be applied to other infrastructure types and hazards. The open and publicly available product will provide opportunities for more innovative products and services to be created.

Impact

There is requirement from both Governments and the community for increased transparency for all risk modelling and information supporting decision-making. There is a need for repeatable, scalable, cost-effective, transparent methods to derive data that helps inform decision making. This presentation will focus on the methodology and data challenges faced during the project in producing the national scale building floor heights product.

Theme

Understanding & assessing hazards & risk

S07.5.2

Environmental information across temporal/spatial scales can assist conservation planning

Mr Jason Hartog¹, Dr Alistair Hobday¹, Dr Claire Mason^{1,2}, Dr Sarah Boulter², Dr Jess Melbourne-Thomas¹, Dr Ingrid van Putten^{1,3}

¹CSIRO Environment, Hobart, Australia. ²University of Tasmania, Hobart, Australia. ³ACIAR, Canberra, Australia



Mr Jason Hartog

Abstract

Historical patterns, combined with near and long-term environmental change all affect the success of conservation actions. The change in climate will not be smooth, and extreme events and seasonal conditions must be considered in planning to improve long-term outcomes. As part of a Climate Systems NESP project, we developed flexible Situational Reports to deliver environmental information for hundreds of regions across Australia based on a variety of spatial planning systems, both national and regional. A Situational Report (SitRep) contains information on the physical climate that can influence the outcome of conservation actions and are generated every three months (as the seasonal data changes) and can be downloaded at any time from <https://adapt-log.csiro.au>. We currently focus on available environmental variables that are known to influence the success of conservation actions – precipitation, temperature (min and max), runoff, evapotranspiration and root zone soil moisture. Because of the need to regularly generate hundreds of reports, we had to balance the provision of targeted information with guidance for users to interpret data for their specific region. The information in SitReps can provide a guide to the changes projected in each region for use by landscape and conservation planners to write plans, implement actions or adjust conservation actions already underway. Historical climate data can be used to assess long-term trends like decreased rainfall or increased temperatures, helping to identify vulnerable species and habitats. Current climate drivers and data help guide immediate actions, such as allocating resources for drought-stressed plants or adjusting water sources for wildlife. Seasonal forecasts inform decisions like planting drought-resistant vegetation before expected rains or temporarily relocating species during extreme heat. Climate projections provide managers with data needed to design protected corridors for species migration or plan firebreaks to mitigate future wildfire risks, ensuring ecosystem resilience in the face of anticipated climate changes.

Theme

Adaptation for natural systems, natural systems for adaptation

S07.5.3

A 'discovery-driven' chatbot to support climate risk and response reporting

Dr Cara Stitzlein¹, Dr Haohui Chen², Ms Suk Yee Yong³, Mr David Evans⁴

¹CSIRO, Sandy Bay, Australia. ²CSIRO, Clayton, Australia. ³CSIRO, Eveleigh, Australia. ⁴CSIRO, Dutton Park, Australia

Abstract

The capacity of businesses to develop feasible climate adaptation plans is central to effectively managing escalating climate risks. We address this challenge through a research project sitting at the intersection of Australia's new climate risk reporting mandates, recent developments in AI technologies, and human-centred design principles.

The regulatory component focuses on the voluntary S1 and mandatory S2 standards based on the Taskforce for Climate-Related Financial Disclosures (TCFD) framework. These require businesses to comprehensively assess and respond to climate impacts across their operations, financials, and environmental footprint.

The technology component includes the development of a searchable database containing thousands of company sustainability reports, powered by a retrieval-augmented generation (RAG) model. This AI-enabled database integrates with a conversational chatbot interface to support natural language queries on the complex reporting standards and company report content.

The solution is customised and trained on Australian context materials, peer-reviewed literature, and best practice guidance – helping to ensure relevance and accuracy. The overall user experience emphasises discovery-driven exploration of the compliance landscape and potential climate adaptation actions. This is a human-centered design approach we see work well in other intimidating decision contexts.

This 2-year CSIRO Responsible Innovation Future Science Platform (FSP) project, with its digital prototype, aims to break down information silos around TCFD reporting. It provides businesses with a powerful AI-assisted tool to better approach climate adaptation and implement robust plans for managing climate-related risks.

By fusing regulatory requirements, AI capabilities, and intuitive design, this work offers a compelling solution to a critical business need in the new era of climate risk regulation.

Theme

Decisions & governance

S07.5.4

GREENspace: Leveraging Spatial Data for Climate-Resilient Green Infrastructure

Miss Georgia Lydiate, Mrs Heather Johnstone
City of Canning, Perth, Australia



Miss Georgia Lydiate



Mrs Heather Johnstone

Abstract

As cities face increasing climate challenges, green infrastructure plays a crucial role in urban resilience. the GREENspace concept is an integrated approach that uses spatially represented data to manage green assets, engage communities, and strategically plan new projects to maximise urban ecosystem benefits.

By mapping and analysing green infrastructure, spatial data provides critical insights into canopy coverage, heat mitigation, biodiversity corridors, and ecosystem services. This data-driven approach allows local governments and urban planners to prioritise projects that enhance climate resilience, improve connectivity between green spaces, and ensure equitable distribution of environmental benefits.

Community engagement is a core principle of GREENspace. Spatial data visualisation fosters public participation by making green infrastructure planning accessible and transparent. Interactive mapping tools help residents understand existing green assets, contribute local knowledge, and support decision-making for tree planting, re-vegetation, and park development.

Additionally, field staff use spatially represented data to streamline communication and reporting, improving coordination between teams and ensuring accurate, up-to-date information on green infrastructure management. This enables real-time tracking of tree planting efforts, maintenance needs, and project progress, enhancing efficiency and accountability.

The strategic application of spatial data also strengthens cross-sector collaboration, aligning urban greening initiatives with transport, drainage, and land-use planning. By integrating ecological and social values into spatial analysis, cities can identify underutilised spaces for transformation, link fragmented habitats, and enhance the overall functionality of urban ecosystems.

Through case studies and practical applications, this presentation will highlight how spatially represented data empowers cities to optimise green infrastructure management, plan future projects with greater precision, and build more connected, climate-adaptive urban landscapes.

Theme

Adaptation in practice

S07.5.5

Prospects of very wet and dry years in Southwestern Australia

Dr Surendra Rauniyar, Dr Pandora Hope, Dr David Jones
Australian Bureau of Meteorology, Melbourne, Australia



Dr Surendra Rauniyar

Abstract

People living in southwestern Australia are very familiar with the region's long-term drying trend. Adaptive measures are in place to provide water – from desalination plants and deeper groundwater. Many studies showed that southwestern Australia's rainfall is projected to further decline in future. This study goes further, providing further confidence in the attribution of the causes of the decline, the possible futures under different emissions scenarios and how the year-to-year rainfall pattern will play out in a drier future.

Historical data indicates a strong drying trend during the cool-season (May-October) with ~20% less rainfall during 2001-2020 period compared to the 1901-1960 reference period average. Climate models appear to simulate realistic levels of decadal rainfall variability in Southwestern Australia and suggest approximately 43% of the observed multi-decadal decline in rainfall can be directly attributed to external forcings, such as greenhouse gas emissions, with internal variability also playing a role. Even under strong cuts to greenhouse gas emissions, further drying is projected over the 21st century. Recent decades have also experienced an absence of very wet cool seasons (i.e., seasons with rainfall > the 90th percentile of the reference period). According to models, the frequency of very wet years is expected to further decrease, while the occurrence of very dry years (< 10th percentile) is projected to increase to such an extent that significant portions of late 21st century will be very dry under higher greenhouse gas emission scenarios. Even if strong cuts to global emissions are made, a return of the very wet years is estimated to be unlikely by the end of this century. These changes pose substantial challenges for agriculture, water resources, and ecosystems in the region. The findings underscore the need for further adaptive strategies to mitigate the impacts of a drier climate and ensure sustainable water management in Southwestern Australia.

Theme

Understanding & assessing hazards & risk

S07.5.6

Landfalling Tropical Cyclones in Western Australia: Hydrometeorological Perspective

Dr Sur Sharmila¹, Ms Rachael Flynn², Dr Pandora Hope¹, Dr Lynn Zhou¹, Dr Wendy Sharples¹

¹Bureau of Meteorology, Melbourne, Australia. ²Monash University, Melbourne, Australia

Abstract

Landfalling tropical cyclones (TCs) are among the most impactful natural disasters affecting Western Australia, bringing destructive winds, storm surges, torrential rain, and flooding as they move inland, crossing regions like the Pilbara, Kimberley, and Gascoyne coasts. These events pose significant threats to communities, leading to long-term challenges such as service disruptions, environmental damage, and economic setbacks. For instance, recent severe TCs, such as Veronica (2019, Cat 4), Damien (2020, Cat 3), Seroja (2021, Cat 3), Ilsa (2023, Cat 5), and Zeila (2025, Cat 5), rapidly intensified before hitting the Western Australian coast, severely disrupting mining and energy industry operations, causing port closures, widespread flooding, and infrastructure damage. Interestingly, some landfalling TCs maintain their strength (maximum wind speed) or even intensify over land, severely impacting hydrological conditions. Recent examples include TC Kelvin (2018) and TC Ellie during the 2022-2023 TC season, which briefly reintensified into tropical storms or sustained their tropical characteristics for days after landfall over Western Australia. Such landfalling TCs in some areas can contribute a significant portion of the total annual rainfall, underscoring their critical role in regional water supply.

In this presentation, we will explore the factors that create the most conducive environment for landfalling TCs to maintain their tropical character over land and the subsequent hydrological impacts. Understanding these factors is crucial for improving forecasting and mitigating the hydrological impacts of landfalling TCs, as well as understanding the implications of climate change on their future behaviour.

Theme

Understanding & assessing hazards & risk

S08.2.1

Functional Isolation: Hidden Consequences of Cascading Infrastructure Failures

Dr Tom Logan^{1,2}, [Dr Mitchell Anderson](#)¹

¹Urban Intelligence, Christchurch, New Zealand. ²University of Canterbury, Christchurch, New Zealand



Dr Tom Logan



Dr Mitchell Anderson

Abstract

As climate change intensifies natural hazards, understanding their full impact requires looking beyond direct exposure to include cascading failures across interconnected infrastructure networks. Current approaches to risk assessment typically overlook the compounding burden of "functional isolation," where communities maintain physical connectivity but lose access to essential services due to utility failures and supply chain disruptions.

This study presents a novel methodological framework for evaluating functional isolation resulting from cascading infrastructure failures during natural hazard events. We analyze impacts across transportation, electricity, wastewater, potable water systems, and building infrastructure in Christchurch, New Zealand during coastal flooding scenarios. Our approach combines high-resolution network modeling of interdependent utilities with assessment of operational supply chains to determine which amenities remain functional post-event.

Results demonstrate a substantial underestimation of disaster impacts when functional isolation is ignored. Non-functional amenities increase by 114%-178% compared to direct exposure estimates, with isolated residential buildings rising by 198% when considering both physical and functional isolation. Access to essential services is significantly disrupted, with average travel distances increasing by 0.5-1 km, and in some cases extending beyond 27 km.

The spatial distribution of functional isolation reveals inequities in impact that would be overlooked in traditional risk assessments. Certain communities become isolated "islands" with physically accessible but non-functional amenities, while others experience substantial increases in travel distances to operational facilities—critical considerations for emergency services and vulnerable populations.

This research demonstrates that equitable climate adaptation and emergency preparedness require understanding the full extent of cascading consequences across infrastructure networks. The framework's flexibility allows application across various hazards, locations, and infrastructure configurations, enabling more accurate identification of at-risk communities and targeted resource allocation in both preparation and response phases.

Theme

Understanding & assessing hazards & risk

S08.2.2

Network Resilience Initiative – Reliable Electricity Supply in a Changing Climate

Mrs Tegan Farley

Western Power, Perth, Australia



Mrs Tegan Farley

Abstract

Western Power embarked on the Network Climate Resilience Initiative to develop a plan that ensures a reliable electricity supply for our customers in the face of changing environmental conditions. This plan, known as the Network Resilience Strategy will outline climate resilience investments in the upcoming 6th Access Arrangement to the Economic Regulation Authority (ERA) as well as continue to inform cost effective management of the network over coming decades.

As climate change intensifies, Australia and regions worldwide are facing increasing risks from hazards such as extreme heat, bushfires, floods, cyclones, and storm events. Electricity network providers around Australia have commenced modelling the impact of changing climate hazards on the existing electricity network, to inform effective response strategies that are developed in consultation with the community and regulators.

Climate projections indicate that Western Australia's weather will continue to change in the coming decades, with more severe impacts ahead. To meet the challenges of changing environmental conditions and to ensure that our network continues to support customer reliability and meet community needs and expectations, Western Power developed the Network Resilience Strategy to detail our approach to enhance network resilience to future environmental conditions.

Electrical network assets have a long lifespan and widespread geographic distribution, making immediate changes impractical. Investment in cost-effective long-term solutions that meet the requirements of future decades necessitates gradual transitions and careful planning. By proactively working to understand the potential impacts of a changing climate on the Western Power network, long-term asset management decisions can be optimised to ensure network assets are designed, planned and maintained to withstand future operating conditions in a manner which is measured and appropriate. This approach will enhance network resilience by investing in solutions that support customer reliability and meet community needs and expectations well into the future.

Theme

Cities, settlements & infrastructure

S08.2.3

The Role of Humidity in Driving Electricity Demand

Mr Ben Quici, Mr Amin Nabipour, Mr David Edwards
Horizon Power, Perth, Australia

Abstract

Electricity demand is strongly coupled to weather. While the relationship between temperature and energy demand is well-established – showing increased consumption in both hot and cold extremes – the influence of humidity remains unclear. Understanding this gap is critical, considering that the combination of high temperatures and high humidities gives rise to extreme heat-stress events where we may naturally come to expect an increased demand for energy. With climate projections indicating simultaneous increases in temperature and humidity across Western Australia, this study quantifies humidity's role in modulating energy demand.

Using high-resolution data from Advanced Metering Infrastructure and Bureau of Meteorology weather stations across 38 Horizon Power distribution systems, we modelled the relationship between energy demand, temperature, and humidity. We first established a baseline using quadratic models to parameterise the response of energy demand to dry-bulb temperature. Then, we employed multivariate models to parametrise the surface formed between energy, temperature and relative humidity. This method treats temperature and humidity as independent predictors of energy demand and enables the direct analysis of their joint influence.

Our findings demonstrate that while dry-bulb temperature remains the dominant driver of energy demand, elevated humidity amplifies the demand towards high temperatures. Models relying solely on dry-bulb temperature can under-predict the energy demand at the highest observed temperatures. Notably, we found no evidence of humidity impacting energy demand at low dry-bulb temperatures.

These results underscore the importance of incorporating humidity into climate-informed energy demand forecasts. Ignoring the exacerbating impact of humidity can lead to substantial underestimations of the expected energy demand, particularly if high-humidity, high-temperature events become more frequent.

Theme

Cities, settlements & infrastructure

S08.2.4

Adapting to climate change impacts on stormwater systems

Mr Nick Deeks

GHD, Perth, Australia



Mr Nick Deeks

Abstract

Climate change is impacting stormwater systems, creating new hazards and elevating existing risks. The nature, degree, and timing of these impacts varies between stormwater asset classes and locations. The author describes the current and future predicted changes to storm hydrology across major urban centres in Australia, including changes to the magnitude and frequency of storm events under different Shared Socioeconomic Pathways. The analysis shows which communities will be impacted sooner, which communities are likely to be at a greater risk, and the location and type of assets that will be at a greater risk. Conversely, the analysis will also identify the communities and assets that are likely to have greater resilience to climate change impacts.

The paper presents an approach for quantifying and assessing the risks across time and space. Examples are given of how climate change can cause an incremental increase in risk for some stormwater systems, whilst other systems will experience a step change in risk, from a tolerable level of risk to an intolerable catastrophic risk of failure. Finally, the paper recommends measures that stormwater asset owners can take to be adaptive to and make their communities and stormwater infrastructures more resilient, focusing on nature-based solutions, solutions that offer ancillary benefits, and solutions that are cost-effective for retrofitting in existing urban environments.

Theme

Cities, settlements & infrastructure

S08.2.5

TC Alfred - a wake-up call for adaptation

Dr Geoff Boughton¹, Dr David Henderson²

¹Cyclone Testing Station, James Cook University, Perth, Australia. ²Cyclone Testing Station, James Cook University, Townsville, Australia



Dr Geoff Boughton

Abstract

Tropical cyclone Alfred approached southeast Queensland as a category 2 event with gust wind speeds estimated at 155 km/h. It stalled on approach and caused strong winds for around 3 days in southeast Queensland and northeast NSW. It also weakened and eventually crossed the coast in the north of Moreton Bay as an ex-tropical cyclone on the evening of 8 Mar 2025. The Cyclone Testing Station conducted a damage investigation immediately after the event.

The measured wind gust speeds were 100 km/h which represented 65% of the forecast wind speeds and 55% of the wind speeds for which buildings had been designed. Even so, there were a few structural failures and around 2.5% of insured properties with no structural damage reported water ingress.

Had the forecast wind speeds occurred, then debris would have been lifted off the ground, branches from trees would have become wind-borne debris, and the combination of broken windows and wind uplift on the roof would have been enough to cause significant roof damage. The presentation will draw on experience from TC Seroja and wind damage scenarios modelled as part of a Severe Wind Hazard Assessment for SE Queensland to put the case for construction of buildings in this area that are more resilient to future tropical cyclones.

Theme

Cities, settlements & infrastructure

S08.2.6

Adapting Perth's active transport infrastructure for a changing climate

Mr David Wake

Department of Transport, Perth, Australia



Mr David Wake

Abstract

Active transport includes walking and riding and is important for liveable cities. Active travel reduces carbon emissions, however climate change poses challenges for active transport.

Perth's active transport network includes 2,165km of shared paths, lanes on roads and low-traffic streets. Some are managed by Main Road WA, most are the responsibility of local government. These routes enable travel for recreation and commuting to work, school or shops.

In recent decades, Perth has experienced more intense heat events and reduced rainfall; trends that are projected to continue.

Heat discourages walking and riding and for those on the network, can affect their health and amenity. Protection from heat matters if we are to boost active travel in a warmer city.

Strategies to adapt Perth's active transport network include:

- Increasing tree canopy along routes - giving shade and moderating urban heating
- Installing built shade/shelter where needed
- Providing water points and rests stops on major routes
- Encouraging travel at times when health risks are less, e.g. outside intense heat
- Promoting mixed-mode trips, e.g. combining walking or riding with public transport
- Adapting infrastructure vulnerable to sea level rise or storms.

Greening active transport routes is a focus for state and local government, including:

- Retaining and adding tree canopy when designing new infrastructure
- Considering retrofitting on existing routes to increase vegetation
- Developing technical guidance to assist planners and engineers to address user amenity in project design, delivery and maintenance.

Main Roads WA and the Department of Transport have partnered with the University of WA to investigate climate adaptation of principal shared paths. The project will use temperature, canopy and socio-economic data to identify vulnerable areas and involve stakeholders in defining practical adaptation measures.

A collaborative approach is being taken to adapt Perth's active transport infrastructure, and help realise the many benefits of a greener, healthier community.

Theme

Cities, settlements & infrastructure

S08.3.1

Coasts and communities: Imagining coastal resilience with art and design

Dr Natasha Pauli^{1,2}, Mr Daniel Martin¹, Dr Carmen Elrick-Barr³, Dr Abbie Rogers^{1,2}, Ms Rosie Halsmith¹, Dr Arnold Van Rooijen^{1,2}, Dr Michael Cuttler^{1,2}, Ms Sofie Nielsen¹, Ms Kate Driver¹, Ms Alice Ford¹, Mr Liam Mouritz¹, Mr Caine Holdsworth¹, Dr Eloise Biggs¹

¹University of Western Australia, Perth, Australia. ²UWA Oceans Institute, Perth, Australia. ³University of the Sunshine Coast, Sippy Downs, Australia



Dr Natasha Pauli

Abstract

Coastal zones are experiencing increasing pressure from the impacts of climate change, environmental change, and population growth. Developing new visions for their long-term future that respond to community values and projected changes can be challenging. This research project presents a novel, interdisciplinary approach to synthesising social science, physical science and landscape architecture, with the goal of providing creative visions for future coastal resilience. Two Western Australian case study locations (the Cockburn coast in southern Perth, and Middleton Bay in Albany) provide an opportunity to explore possible coastal futures in areas that are experiencing rapid change, and gain stakeholder feedback. Participants from the local community were asked to express what is important to them about a place along their local coast, through a variety of media including paper collage, textile creation, photography and poetry, resulting in over 70 community-created artworks. Participants were interviewed to understand the values embodied in their artwork, and the ideal future of the places they depicted. Key themes from the workshops and lectures in nature-based engineering formed the basis of integrated briefs for a series of landscape architecture studio units with undergraduate students at the UWA School of Design, aptly named 'Rising Tides Studio'. The imaginative designs for key public precincts within the study were displayed at public art exhibitions, alongside the artworks created by community members. We sought feedback from the broader community and from those involved with adaptation planning on the degree to which these representations can spark constructive stakeholder conversations around adaptation planning for areas affected by climate change. Results indicate positive interest from key stakeholder groups to adapt the approach to envision coastal futures.

Theme

Social & economic dimensions of adaptation

S08.3.2

Communicating climate locally: Pragmatic realism in the Huon Valley Council

Dr Malcolm Johnson

Huon Valley Council, Huonville, Australia



Dr Malcolm Johnson

Abstract

This presentation examines how reframing climate communication approaches can build community capacity for adaptation through a case study of the Huon Valley Council in lutruwita/Tasmania. Drawing on experiences leading climate change action at council, this presentation demonstrates how locally-centred dialogue has transformed community engagement with climate adaptation planning.

The reflection explores how communication that prioritises local impacts and responses over global narratives creates more effective pathways for knowledge sharing and integration. By focusing conversations on the council's immediate sphere of control and influence, this approach has particularly resonated with traditionally "climate unconcerned" community members who previously viewed climate conversations as irrelevant to local concerns (Lucas & Davison, 2018).

An example of this communication strategy is the innovative BE CALM initiative, which facilitates meaningful dialogue about climate impacts while providing practical resources for managing climate anxiety. This dual approach creates space for integrating diverse knowledge systems—from technical climate projections to lived experience of changing conditions—while empowering community members through actionable, locally-focused adaptation responses. The initiative demonstrates how councils can foster conversations that balance honest communication about climate impacts with constructive support for community resilience (Bond & Bath, 2020).

The presentation critically examines how this communication framework has influenced council decision-making confidence, particularly in developing adaptation strategies that reflect community priorities. It challenges conventional approaches to climate communication by advocating for dialogue that acknowledges inevitable changes while creating space for diverse knowledge systems to inform meaningful local preparation and action (Cox & Cox, 2020).

This reflection contributes to broader discussions about effective climate communication in local government contexts, particularly for resource-limited rural/regional councils (Jackson, 2024). It offers insights into how reframing climate conversations through a community-centered lens can build broader community support and create more effective knowledge-sharing pathways for meaningful climate adaptation at the local government level.

Theme

Tell it, talk it

S08.3.3

MAKING SENSE OF CHANGE: MANAGING PROTECTED AREAS UNDER CLIMATE CHANGE

Dr. Claudia Munera-Roldan

Fenner School of Environment and Society, The Australian National University, Canberra, Australia. CSIRO, Environment, Canberra, Australia



Dr. Claudia Munera-Roldan

Abstract

Setting and managing protected areas are human responses to specific narratives and political processes defining which portions of land or oceans should be preserved and what knowledge is relevant for making decisions about those conservation values. In the process, the future of these areas is presented as something 'good', necessary, and often unchanged, while closing options to imagine alternative futures.

Protected areas aim to be long-term. However, practices and resource allocation are often short-term, resulting in a disconnect between management actions and ecological response times. However, climate change and other drivers of change challenge the commitment of protected areas in the future, raising questions about their long-term goals. Meanwhile, managers are facing difficult decisions about how to adapt conservation strategies under rapid change.

This work presents results from interviews held in Australia, Colombia, and South Africa with practitioners and researchers working in protected landscapes. The interviews aimed to understand how managers make sense of change, how they conceptualise adaptation, their level of awareness of climate change impacts and what could be implications for management.

The findings reveal a range of adaptation concepts, approaches, and anticipated outcomes. Management decisions are influenced not only by the extent of change they are willing to accept but also by existing rules and norms, which in turn shape the rationale for adaptation, including the adaptation of what, the processes, plans, and expected outcomes of adaptation.

Understanding how people make sense of abstract concepts, such as climate change, is a crucial step in facilitating deliberations to negotiate potential contradictions between individual and collective aspirations for adaptation, which can promote more proactive decision-making processes. The findings underscore the importance of broadening governance approaches to foster a sense of agency, thereby facilitating the reframing of current narratives and the identification of shared visions of the future of nature.

Theme

Decisions & governance

S08.3.4

Upskilling a conversation: The Carbon Farming Outreach Program

Dr Mary-Anne Glanzlowe¹, Mrs Maddison McNeil¹, Mr Douglas Rodgers¹, Mrs Rikki Foss¹, Dr Joanne Wisdom^{1,2}

¹Grower Group Alliance, Perth, Australia. ²The University of Western Australia, Perth, Australia



Dr Mary-Anne Glanzlowe



Mrs Maddison McNeil



Mr Douglas Rodgers



Mrs Rikki Foss



Dr Joanne Wisdom

Abstract

The Carbon Farming Outreach Program in Australia offers a multifaceted approach to addressing climate change while enhancing agricultural productivity and sustainability. The Carbon Farming Outreach Program is an Australian Government Program funded through DCCEEW, carried out by Grower Group Alliance. This national outreach program offers insights to a way of addressing upskilling conversations and decision making rather than forcing a change. There are two parts to the program, the train the trainer component, including a community of practice for those trainer participants, and the community workshop components. The program is setup to upskill 146 trainer participants around the country, for those trainers to run 160 workshops in their own community with locally relevant and commodity specific information. To measure the outcomes a major component of the program is also to integrate monitoring evaluation and learning into the program to be able to gain insight easily and in real time. The Carbon Farming Outreach Program in Australia stands out due to its innovative and flexible approach, allowing the program to be adapted for multiple regional, sectorial and skill level contexts. This approach has allowed the program to be responsive to local needs while having clear government reporting metrics from the outset. Central to the program is the principle of upskilling through conversation, focusing on delivering what people need, integrating the best practices, and ensuring the ongoing legacy of the program lies in the enhanced skills. The program emphasises providing independent advice and appropriate information, supporting decision-making without imposing solutions, and guiding trainer participants along a knowledge pathway. Additionally, it fosters collaboration through a community of practice, promoting shared learning and collective progress. Overall, the Carbon Farming Outreach Program exemplifies a progressive model for upskilling sustainable land management and climate resilience in Australia.

Theme

Tell it, talk it

S08.3.5

Changing communities and changing coasts: CoastAdapt community engagement 8-years on.

Dr Kathleen Broderick¹, Ms Anne Leitch²

¹Broderick and Associates, Perth, Australia. ²Griffith University, Gold Coast, Australia

Abstract

Community engagement in coastal planning is a blend of art and science, requiring approaches tailored to specific local contexts. In 2017, CoastAdapt (CoastAdapt.com.au) developed community engagement resources to assist coastal councils in communicating with their communities about changing coastlines. These resources, based on expert input and a systematic review of academic and grey literature, have since been widely used and highly valued.

A 2024 review of the CoastAdapt community engagement manual was undertaken by a panel of local government managers, consultants, and academics from Australia with input from New Zealand. This review identified case studies and success stories of leading that offer inspiration to both novice and experienced coastal managers. It also revealed several significant changes in the communication landscape since the manual's original release.

Key changes include:

1. Many coastal councils have completed one or more rounds of coastal hazard mapping and adaptation planning with their communities. Additionally, many communities have now experienced the direct impacts of coastal hazards, elevating public interest in coastal planning and framing the conversation within the broader context of global climate change.
2. Coastal management expertise is increasingly in demand, underscoring a pressing need for updated resources, ongoing training, and consultant support to help councils engage effectively.
3. Progressing from planning to the identification and implementation of community-supported adaptation options has been slow, requiring more proactive approaches.
4. Renewed efforts are necessary to engage communities in planning and executing local coastal adaptation strategies, while also fostering broader discussions about the transformation and transition of coastal communities.

Considering these shifts, we collaborated with consultants and council staff to update the CoastAdapt community engagement manual. The revised materials offer refreshed guidance to help coastal councils foster meaningful community engagement and create opportunities for lasting, positive change.

Theme

Social & economic dimensions of adaptation

S08.3.6

The Experience of Climate Migration in Pakistan

MS Khushboo Fatima Khan

Deakin University, Melbourne, Australia



MS Khushboo Fatima Khan

Abstract

Pakistan is currently at a grave stage regarding its responses to the challenges posed by climate change. It has been identified as the 8th most vulnerable country in the world to the impacts of climate change. Migration is one of the primary coping mechanisms that the people of Pakistan follow to combat climate change. Climate migration happens when people leave their homes or places of origin due to sudden or gradual climate-related events like riverine or flash floods, heavy rainfall, extreme weather events, wildfires, droughts, sea-level rise, or increasing water scarcity. Migration caused by climate change is known by various terms, like “environmental migration”, “climate migration”, “environmental displacement”, “climate-induced migration”, or “climigration”. Gradual climate change may lead to permanent migration, affecting livelihoods and socio-economic dynamics, while rapid-onset disasters cause temporary or permanent displacement. In 2021, climate change was the leading factor responsible for migration in Pakistan, causing 70,000 to be displaced within the country, and it is estimated that there will be more than 2 million migrations within Pakistan by 2050 (GRID, 2022). While there is rich literature available about the international migration dynamics of Pakistan, there is a noticeable scarcity of research addressing the question of migration because of climate change and how people are navigating this whole experience considering Pakistan's socioeconomic context. The issue of climate change is complex, as it exacerbates existing problems with human mobility and makes it more challenging to understand the different factors that influence migration. Countries in the Global South, like Pakistan, produce minimal carbon emissions, but they suffer the most from the adverse effects of climate change. People of Pakistan adapt to “migration” as a coping mechanism because of insufficient government support. When natural disasters force communities to migrate, national and international regimes must ensure their safety, and support for sustainable development

Theme

Adaptation in practice

S08.4.1

Getting Better at Coastal Hazard Management

Dr Matt Eliot

Seashore Engineering, Perth, Australia



Dr Matt Eliot

Abstract

How can we get ahead of the game? Where should we focus our attention?

Management of coastal hazards occurs across multiple jurisdictions. It requires considerable time, effort and funding.

Coastal management without a clear strategy is whack-a-mole, responding reactively to every emergent or perceived issue. This approach constrains decision-making, reducing the time available to understand underlying causes, or put in place a wider range of tools to mitigate hazards. Without time, we inevitably end up with expensive engineering responses, controversial managed retreat or disastrous failure.

Review of WA coastal hazard management has shown a history of falling into the same old traps, often a result of jurisdictional or policy blind spots. The WA Government has recognised these issues and coordinated a pathway towards a more proactive, strategic management of coastal hazards.

A core piece of this review was prioritisation of townsites at risk, as doing the groundwork early gives the best chance to choose a better outcome. This has led to targeted investigations and solution building.

Bottlenecks and barriers to coastal hazard mitigation were identified through evaluation of institutions, governance, policies, available information, assessment tools and actions. Responses include changing the way knowledge is shared and distributed between different levels of government and directing policy revision towards more effective integration of planning, building design and disaster risk management.

Theme

Decisions & governance

S08.4.2

Coordinating the best Coastal and Marine Mapping for Western Australia

Mr Ralph Talbot-smith

Department of Transport, Fremantle, Australia



Mr Ralph Talbot-smith

Abstract

Introduction

Western Australia's Department of Transport (DoT) plays an integral part in collecting and coordinating spatial data for effective management of Western Australia's Coastal Climate resilience.

Western Australian has a coastline approximating 20,000 kilometres of marine & coastal environments of which only 25% has been surveyed and effectively mapped.

Abstract

Today Ralph will be outlining some initiatives to map significant parts of the WA Coast to assist in the assessment of potential coastal inundation as a result of climate change and modelling of erosion hotspots and watchspots around the state.

Capture of this information will provide multiple base datasets to assist all levels of Western Australian Government and the whole marine and coastal community to model and educate the public on impact and mitigate risks to the community.

The presentation will also cover the AusSeabed web portal, Project overview and progress of Department of Transport's Bathymetric Data capture and management initiatives.

Theme

Cities, settlements & infrastructure

S08.4.3

Coasts and communities: A values database for coastal hazard management

Dr Alaya Spencer-Cotton, Associate Professor Abbie Rogers, Associate Professor Michael Burton, Dr Curtis Rollins, Ms Cheryl Day
University of Western Australia, Perth, Australia

Abstract

Coastal communities are on the frontline of climate change, facing increasing risks from erosion, inundation, and other hazards. While technical feasibility is often a central consideration in planning responses, community values—including those for recreation, amenities and natural assets—play a critical role in shaping socially acceptable and enduring solutions. Processes like Western Australia's Coastal Hazard Risk Management and Adaptation Planning (CHRMAP) require the inclusion of community values through mechanisms such as advisory groups, open consultations, and community preference surveys. However, a persistent challenge is determining how to appropriately weight these community values against other important considerations, including the financial costs and benefits of different adaptation options. High implementation costs and the influence of vocal stakeholder groups can crowd out the pursuit of outcomes that are more widely supported.

In response, this project is applying economic non-market valuation (NMV) methods across eight diverse case study sites in WA to capture community preferences for coastal assets. These representative sites span a variety of coastal settings and hazard risks. The NMV results will inform the development of a value repository and decision-support database, designed to help local governments and coastal planners with benefit-cost analysis and 'benefit transfer' in areas where local data on values is unavailable.

Initial case study results—from sites such as Yanchep, Mandurah and Broome—will offer insight into the variation and similarities of coastal values across the state. By compiling robust economic evidence across different erosion hotspots, the project aims to deliver a practical and scalable tool that supports transparent, value-driven prioritisation of coastal adaptation options across Western Australia.

Theme

Social & economic dimensions of adaptation

S08.4.4

Valuing Coastal Adaptation: Economic Insights for Smarter Investment Decisions

Miss Sarah Leck¹, Ms Vivienne Panizza², Ms Kath LaNauze²

¹Ricardo, Perth, Australia. ²DPLH, Perth, Australia

Abstract

Australia's coastline is increasingly vulnerable to erosion, inundation, and storm surges, with climate change accelerating these risks. Despite the high cost of inaction, investment in adaptation remains limited. Demonstrating the economic value of adaptation measures is crucial for securing funding and guiding decision-making. This presentation shares key lessons and insights from recent economic assessments of coastal adaptation measures, offering practical recommendations for integrating economic analysis into adaptation planning.

Economic assessment is often underused in coastal adaptation decision-making, especially compared to standard infrastructure projects, which follow clear economic guidelines and methodologies. Challenges in applying economic analysis include data limitations, defining the base case, and assessing long-term benefits. However, where applied effectively, economic analysis has provided compelling evidence for action, helping decision-makers weigh adaptation options such as protection, accommodation, and managed retreat based on their long-term costs and socio-economic benefits.

Our analysis highlights several critical insights:

- Adaptive pathways and strategic timing of investment are essential for delivering net benefits to communities
- Nature-based solutions and soft adaptation measures, such as those preserving recreational and ecosystem services, can offer significant value—even in high-value property areas.
- Some adaptation options, such as managed retreat, are harder to quantify economically, but this does not necessarily mean they are less beneficial for the community.

This presentation explores successful applications of economic analysis, the remaining challenges and gaps, and provides practical recommendations for improving the use of economic tools in adaptation decision-making. By strengthening economic justifications, we can enable more strategic, cost-effective, and timely investments in coastal adaptation, ensuring long-term resilience for communities and ecosystems.

Theme

Social & economic dimensions of adaptation

S08.4.5

The challenges of coastal planned / managed retreat in Western Australia

Mr Karl Ilich

Water Technology, Fremantle, Australia



Mr Karl Ilich

Abstract

For coastal erosion and inundation hazards in Western Australia (WA) the preferred adaptation pathway, since 2013, is to implement Planned / Managed Retreat to move built and natural assets away from the coast to provide a semi-natural coastal foreshore into the future.

The pathway is often recommended in strategic planning studies like the WA Coastal Hazard Risk Management and Adaptation Planning (CHRMAP) projects. In modern times, the pathway has only been implemented a handful of times in WA and all for relatively low value public infrastructure. Compared to other pathways (Avoid, Accommodate and Protect) there is a lack of case study information.

This study investigated the status of adaptation pathway (and subsidiary options) recommendations across the state. A summary of pathway recommendations is presented against other characteristics of each site such as recommendations source study, assessment ratings, implementation timeframes, costs, type of vulnerable assets and coastal context. An index was developed to consider pathway recommendations using a Multi-Criteria Analysis toolkit. The index results were heat mapped at locations around WA.

The challenges to local coastal managers progressing with a recommendation to implement Planned / Managed Retreat and work on practical proactive planning responses are presented. Recommended case studies and pilot projects to progress the development of the Planned / Managed Retreat pathway for coastal hazards are provided. These are important as practitioners and decision-makers will learn from appraising early projects and be able to improve them.

Theme

Social & economic dimensions of adaptation

S08.4.6

Co-developing maps to inform adaptation to increased coastal storm tides

- Julian O'Grady¹, - Helen Bloustein²

¹CSIRO, Melbourne, Australia. ²DEECA, Melbourne, Australia

Abstract

As sea-level rise (SLR) accelerates, coastal communities face increasingly frequent tidal nuisance flooding and more extreme storm-tide events. Once occasional disruptions, tidal flooding now regularly inundates low-lying paths and streets, while extreme storm-tides—driven by the combination of storm surges and high tides—threaten critical infrastructure. Historically considered rare 100-year events, these storm-tides are expected to occur more often as SLR progresses. The threshold for chronic inundation remains uncertain. While it is informed by flood frequency, is dependent on the adaptive capacity of coastal systems.

This study, part of the NESP ESCC hub, investigates storm-tide flooding across the Torres Strait and southeastern Australia for the past periods 1995–2024, and the future period 2025–2054. Using open-access geospatial data such as digital elevation models (DEMs), OpenStreetMap, and satellite imagery, we maps changes in inundation frequency and potential hotspots of chronic inundation. These maps overlay water levels onto DEMs to show how many years specific sites may experience flooding above certain thresholds, providing a clear view of potential inundation hotspots.

Prototype tools developed through this project aim to engage stakeholders and facilitate co-designed, accessible terminology for adaptation planning. Although validation is still in the early stages, historical flood records from hotspot locations (1981–2020) are used to align water level data with DEMs. Future refinements will incorporate local knowledge and improve elevation models to enhance accuracy.

This research offers valuable insights into how storm-tide patterns may evolve, helping identify vulnerable regions and laying groundwork for future adaptation measures. Further validation, community collaboration, and refinement of the tools are needed before they can support effective coastal planning and policy development.

Theme

Understanding & assessing hazards & risk

S08.5.1

Insights into communities' ability to tolerate flooding – evidence from Aotearoa-NZ.

Dr Paula Blackett^{1,2}, Dr Sarah Harrison^{1,2}, Dr Vivienne Ivory³, Mr Justin Connolly⁴, Mrs Paula Holland⁵, Dr Edgar Pacheco³

¹Urban Intelligence, Hamilton, New Zealand. ²University of Waikato, Hamilton, New Zealand. ³WSP, Wellington, New Zealand. ⁴Deliberate, Hamilton, New Zealand. ⁵NIWA, Hamilton, New Zealand



Dr Paula Blackett

Abstract

Flooding is currently Aotearoa-New Zealand's most frequent and consistently damaging hazard causing significant damage to infrastructure, property and affecting everyday lives. Unfortunately, the frequency and magnitude of flood events are projected to increase as the climate changes, meaning we can expect an increase in associated damage and disruption.

As part of '*Mā te Haumuru ō te - Wai Towards a more flood-resilient Aotearoa New Zealand*' a 5-year research programme, we explored societal vulnerability to repeat flood events through three historical case studies. Our case studies cover rural and urban catchments and a range of flood events varying by magnitude and frequency of rainfall. Based on 53 semi-structured qualitative interviews we developed case specific causal loop diagrams which were used to identify common features and patterns of impact over time.

An obvious feature of all three causal loop diagrams was the slow erosion of the ability and willingness of individuals and communities to tolerate flood events, especially when the time between events is reduced. In this presentation we will explore the fluid nature of tolerance, exposing the factors that influence tolerance and how these may interact. In particular, we focus on how tolerance to flooding varies, particularly to the cumulative impacts from repeated historical events, or the threat of repeated future flooding. Threats to life, property investments, quality of life, and personal investments in future lifestyles all challenge people's willingness to tolerate future flooding. We note that time between events matters, meaning that without sufficient time to fully recover and experience life as normal, the trauma from flooding accumulates and the desire to remain in place diminishes. We will conclude the presentation with observations for policy-makers and planners who need to grapple with what a fluid tolerance to events means for the future of communities in flood prone regions.

Theme

Social & economic dimensions of adaptation

S08.5.2

Risk and the emergence of new socio-ecological thresholds

Dr Douglas Bardsley

The University of Adelaide, Adelaide, Australia



Dr Douglas Bardsley

Abstract

There is growing evidence that many communities are reaching levels of climate change impacts that are reaching social tolerance thresholds. Recent research examining climate change impacts and adaptation within rural communities in Australia, the South Pacific, Asia, Europe and North Africa is all suggesting a common theme of people increasingly being forced to significantly change their behaviours and/or systems to withstand the new scope of socio-ecological risk. This paper will focus on elements of that socio-ecological research, examining compound risks both with vigneron in South Australia and Switzerland, and with mountain farmer communities in Nepal. Those studies each suggest that increasing levels of compound climate change risk are driving rapid socio-ecological change, which in turn is leading to new socio-ecological thresholds.

As thresholds of socio-ecological tolerance are passed, a range of impacts are dispersing across society that are going to need recognition and resourcing to ensure that broader impacts of climate change do not work to undermine or limit other societal actions. Part of any effective response will be to ensure that reflexive forms of adaptation are developed in association with local communities to appropriately guide unique responses at different systemic scales. Beyond those specific socio-ecological attempts at adaptation however, the dispersing climate change impacts will need to inform adjustments in natural resource, hazard management and land use planning that guide institutional evolutions in industries from forestry and agriculture through to tourism and urban development, which will be experiencing the flow-on effects of the non-linear social adjustments to risk. Without such whole-of-system knowledge to guide adaptation to climate change across societies, new socio-ecological risks will continue to be generated at multiple scales that will be increasingly difficult to negate or prepare for.

Theme

Social & economic dimensions of adaptation

S08.5.3

Cascading impacts: changing climate across the social and built domains

Dr Stephanie Jacobs¹, Mr Ross Henry², Dr Matt Beaty³, Dr Andrew Higgins⁴, Dr Rajiv Jayasena⁵, Dr Geoffrey Lee⁵, Mr Greg Williams⁵, Dr Judith Landsberg⁶, Mr Eric Lede⁷

¹Bureau of Meteorology, Melbourne, Australia. ²Australian Climate Service, Brisbane, Australia. ³Australian Bureau of Statistics, Melbourne, Australia. ⁴CSIRO, Brisbane, Australia. ⁵CSIRO, Melbourne, Australia. ⁶Australian Climate Service, Melbourne, Australia. ⁷Australian Climate Service, Canberra, Australia

Abstract

This presentation reports on the integration of climate hazard data with other risk information—exposure, vulnerability, response—to inform Australia's current and future risk profile. The analysis draws on the latest science and data from the National Climate Risk Assessment to explore potential impacts of climate change on interconnected systems that shape Australian society.

Many communities are in vulnerable circumstances and are already experiencing the impacts of climate change. Extreme heat and air pollution associated with bushfires are increasing strain on the health system, while storms and flooding are disrupting critical infrastructure and supply chains. Rising sea levels are rendering properties uninsurable as their risk of inundation increases. These impacts cascade through society, particularly when occurring at the same time or in near succession.

By mid to late century as climate hazards generally become more frequent and severe these impacts are expected to worsen. Severe impacts from extreme weather, sea level rise and water security challenges are expected across all regions. Existing socio-economic vulnerabilities will be exacerbated along with threats to community cohesion and new bio-security issues such as increased transmission of vector-borne diseases unfamiliar to the health system.

Theme

Understanding & assessing hazards & risk

S08.5.4

Adaptation responding to multiple drivers of change in the MDB

Dr Josephine Mummery, Dr Leonie Pearson
University of Canberra, Canberra, Australia

Abstract

Socio-ecological regions across Australia such as the Murray–Darling Basin are facing multiple drivers of change, one of which is climate change. Over the past 15 years the Basin has grappled with a decline in returns in traditional agricultural markets, shifts in consumer preferences and also new market opportunities, significant drought and flood events, major policy changes, and several catastrophic hypoxic water events, among other things. In response, the Basin's communities, industries and environments are changing in their mix, location, health and resource-dependency. A changing climate interacts with all of these other social, environmental, institutional and economic drivers of change, and with the emerging responses to them, in ways that may either increase or decrease vulnerability to climate change impacts. Defining effective climate adaptation options and pathways in this dynamic context is complex, and needs to be built on a robust appreciation of the dominant drivers of change in a region, their impacts and likely trends, and how they will interact with climate change.

This research is exploring resilience, drivers of change and adaptation in the Basin, how they intersect, and what they mean for maintaining the Basin's values. Key drivers of change have been identified for the Basin and major sub-Basin regions, and local case studies are revealing multiple adaptive capacities, both growing resilience and an embedding of future vulnerability in some regions, and a need for greater attention on climate adaptation. The findings of case studies in irrigated agriculture, tourism, and dryland agriculture in the Basin will be contrasted, with the opportunities and limits of adaptive measures for current climate resilience identified in the context of climate change.

Theme

Social & economic dimensions of adaptation

S08.5.5

Socio-Ecological Triage: Bioregionalism as a rational response to the polycrisis

Professor Paul Sutton

University of Denver, Denver, USA. University of South Australia, Adelaide, Australia



Professor Paul Sutton

Abstract

Socio-ecological triage refers to the active or passive willingness to sacrifice human lives, landscapes, ecosystems, and/or wildlife to unfolding environmental and/or social crises that are perceived as insoluble. Recent events suggest that many global leaders are passively allowing socio-ecological triage to take place. Examples include passive responses to the IPCC and IPBES reports on climate change and biodiversity loss, attempting to dissolve USAID, and attempting to close borders to international refugees. The term 'polycrisis' refers to the suite of interconnected and mutually reinforcing global challenges which include climate change, biodiversity loss, wealth inequality, political instability, and growth-driven capitalism. As climate change and biodiversity loss mutually interact to cause myriad manifestations of environmental degradation, the ecosystem services essential to human survival continue to be permanently and irreversibly degraded. The increased risk of these hazards is threatening the viability of our financial system. To wit, the recent climate change aggravated fires in Los Angeles have been estimated to have caused \$250 Billion in damage which is shaking the foundations of our insurance system. Meanwhile, maldistribution of wealth and power drives unsustainable consumption patterns, often privileging the wealthiest and most powerful, further perpetuating inequality. Growth-oriented capitalism fuels these issues by prioritizing endless economic expansion over ecological balance and social well-being, creating a vicious cycle where each crisis intensifies the others. Failure of governance and leadership, especially by the world's most powerful countries, to address the polycrisis is glaring in their inadequate responses to the mounting challenges. Bioregionalism offers a viable path for vulnerable countries, regions, and individuals to safeguard their future. By focusing on local solutions that are tailored to the unique environmental and cultural conditions of each region, bioregionalism allows for a more resilient, self-sufficient response to the mounting pressures of the polycrisis.

Theme

Social & economic dimensions of adaptation

S08.5.6

Small Rooms and Big Ideas

Ms Kate Nairn¹, Prof Emma Lee²

¹Future Earth Australia, Canberra, Australia. ²Federation University, Burnie, Australia



Ms Kate Nairn



Prof Emma Lee

Abstract

This is a reflection on decolonisation in action as part of the Future Earth Australia (FEA) Just Adaptation Expert Working Group. Often, the domain of researchers centres big ideas - climate change, just transitions, normative lenses and so forth. Not often enough is attention paid to where these ideas are played out – through small rooms and collectives. Across 2022, FEA convened the Expert Working Group for *A National Strategy for Just Adaptation* in virtual spaces, our “small rooms”. The “what is just adaptation?” discussions were had, and the intellectual frameworks built for how this can be applied to different parts of society and decision making.

However, this process came crashing down when one of the Indigenous experts, Prof Emma Lee, stopped it in its tracks. She pointed out, put simply, that this group and this process was failing to apply that very process to ourselves in regards to Indigenous leadership. A bracing realisation for those actively trying to advocate for it. It brought to light the systemic gaps that shape experiences for Indigenous Peoples in these spaces, despite best of intentions.

It was a turning point – for the project and the many people involved. The experts gathered in the small room had to abruptly grapple with their own blind spots and restart from a new place. A space generously opened by Aunty Emma to reflect and recollect and go forward – still imperfectly, but together.

Theme

Adaptation in practice

S10.2.1

Cairns, a city at risk or opportunity?

Dr David Rissik¹, Ms Shannon Haines², Ms Sophie Barrett³

¹BMT, Sydney, Australia. ²Moreton Bay Regional Council, Moreton Bay, Australia. ³Cairns Regional Council, Cairns, Australia

Abstract

Coastal changes from storm tide inundation, erosion, and climate-driven sea level rise will significantly impact Cairns' natural and built environment, community well-being, and economy. To understand these risks and develop effective responses, we conducted a comprehensive climate change risk assessment. This assessment identified key hazards, prioritised management actions, and outlined a phased implementation strategy.

The adaptation strategy is guided by a set of principles developed in collaboration with senior council staff and elected officials. The risk assessment process was further strengthened by extensive stakeholder engagement, despite challenges posed by COVID-19.

Several factors make Cairns particularly vulnerable to coastal changes:

- The large area expected to be affected by rising seas and erosion.
- The critical infrastructure at risk, compounded by Cairns' relative isolation.
- Cairns' role as a gateway for tourism and access to the Cape.
- The region's reliance on a 'rainforest and reef' tourism identity.
- Traditional Owner connections to Country, with ongoing adaptation efforts.
- A strong disaster management culture and community resilience.

This presentation will cover our risk assessment methodology, engagement process, and key findings. We will also share lessons learned and discuss how the recommendations are being implemented. Finally, we will highlight the major challenges to adaptation in a low-lying, high-risk region like Cairns and explore pathways for building long-term resilience.

Theme

Understanding & assessing hazards & risk

S10.2.2

Managing heat in a tropical city. Application of microclimate modelling

Dr David Rissik¹, Dr Fahim Tonmoy², Ms Sophie Barrett³, Prof Lisa Law⁴

¹BMT, Sydney, Australia. ²Deloitte, Brisbane, Australia. ³Cairns Regional Council, Cairns, Australia. ⁴JCU, Cairns, Australia

Abstract

Heat and heatwaves are an escalating challenge in urban areas due to climate change, with increasing intensity and frequency posing risks to human health, liveability, and infrastructure. In Cairns CBD, the urban heat island (UHI) effect exacerbates these risks, particularly for vulnerable populations such as the elderly and low-income households. This project involved building a digital twin of the Cairns CBD to investigate the spatial distribution of heat, thermal comfort, and vulnerability across the CBD, alongside the effectiveness of recent urban greening projects and future heat mitigation strategies and model interventions to reduce the UHI effect. Working with JCU's tropical Design, 76 Internet of Things Lorawan sensors were installed to provide real time monitoring of temperature and humidity to determine the baseline condition and evaluate interventions over time.

Analysis revealed that southern parts of the CBD, dominated by industrial and commercial land use, experience higher temperatures compared to the greener northern Esplanade. Areas with landscaping and urban greening interventions between 2018 and 2020 showed reduced temperatures, highlighting the cooling benefits of vegetation. Microclimate simulations identified increasing greenery and shade as the most effective short-term interventions, while longer-term strategies, such as cool roof technology, permeable pavements, and green roofs, offer additional solutions.

Pedestrian movement data revealed hotspots with high temperatures and activity and identified areas for improved walkability and human comfort, prioritising these areas for cooling measures. Stakeholder engagement and integration of heat mitigation into planning processes are critical, alongside robust emergency response plans. This is important for tourist centres such as Cairns which will host visitors not acclimatised to heat and humidity. Additionally through JCU, students were engaged to study the data and urban design and develop heat masterplans for the City Centre. As climate change intensifies, these strategies will safeguard Cairns' community and ensure urban resilience.

Theme

Cities, settlements & infrastructure

S10.2.3

High resolution modelling of the Perth urban heat island

Dr M.O. Mughal¹, Dr. H.M. Imran¹, Dr Jatin Kala², Dr Julia Andrys², Dr. Anthony Stuart¹

¹Department of Water and Environmental Regulation, Perth, Australia. ²Murdoch University, Perth, Australia



Dr. H.M. Imran

Abstract

Perth's population has recently surpassed 2.1 million, driving increased demand for urban infrastructure with the associated anthropogenic heat as described by the urban heat island (UHI) effect. The UHI indicates how hot an urban area is compared to rural surroundings. The significance of the UHI effect in Perth has not been studied in fine detail, including the potential mitigating influence of the sea breeze, colloquially known as the "Fremantle Doctor". The Department of Water and Environmental Regulation (DWER) is modelling high-resolution urban temperature data sets for Perth for current climatic conditions as well as projected future climate. This effort directly complements the development of climate resilience strategies to mitigate the impacts of the UHI.

The Weather Research and Forecasting (WRF) model has been chosen as the modelling platform and is coupled to the community multiscale air quality model (CMAQ) model to investigate the interactions between UHI and air pollution. The modelling is supported by high-resolution input data sets developed by leading authorities in Perth and elsewhere in Australia. Although WRF is a community model, certain aspects such as the incorporation of gridded anthropogenic heat from buildings, are not available by default within the Single Layer Urban Canopy Model (SLUCM) scheme. Therefore, project collaborations have been extended globally, with international partners providing support to improve such scheme.

The evaluation of model simulations is crucial for accurate modelling outcomes and a sophisticated monitoring system has been developed to provide observed/validation data. This system also provides real-time measurements of Perth's UHI.

Modelling of future climate scenarios requires incorporating future data sets into WRF. State-of-the-art projections developed by the Western Australian Climate Science Initiative (CSI) will be used to provide climate input for UHI projections up to 2100.

Theme

Cities, settlements & infrastructure

S10.2.4

Urban Greening: Local Government's Role in Climate Adaptation

Mrs Melanie Davies

WA Local Government Association, WA, Australia



Mrs Melanie Davies

Abstract

Investing in planting and retaining mature trees and existing native vegetation in urban areas are essential strategies to adapt to the higher temperatures associated with climate change and mitigate against heatwave disaster. Urban greening can reduce the urban heat island effect by up to 10°C, as well as delivering a wide range of other health, social, biodiversity, amenity and economic benefits.

Despite the well documented benefits of urban greening, in most urban areas across Western Australia there has been a decline in canopy cover. Perth has 16% canopy cover, the lowest of all capital cities in Australia, with 41% of Local Governments experiencing a significant loss of canopy. Significantly, 85% of Perth's tree canopy is on private land, underscoring the need for a regulatory mechanism to consider the removal of trees as a form of development.

WALGA has led advocacy, policy and programs to support Local Governments in the protection and growth of urban forests for over ten years. This presentation will discuss key initiatives contributing to climate adaptation through urban greening, including:

- Engagement with decision makers, including State Government and Local Government Elected Members;
- Development of WALGA's planning policies and guidelines to facilitate tree preservation during land development and protect locally significant natural areas;
- Priority projects of the Local Government Urban Forest Working Group, including identifying climate ready species and fostering community engagement and local action; and
- Design of urban greening grant programs and mapping tools to prioritise investment in areas of high urban heat and community need.

Theme

Cities, settlements & infrastructure

S10.2.5

Weathering the storm, adapting Victoria's infrastructure to climate change

Ms Caroline Evans, Mr Llewellyn Reynders
Infrastructure Victoria, Melbourne, Australia



Ms Caroline Evans



Mr Llewellyn Reynders

Abstract

Recovering from extreme weather events costs Victoria an average of \$2.7 billion a year. Victoria will continue to be impacted by frequent and intense weather, putting infrastructure at risk. Without early action to better protect infrastructure, it will fail more often, harming people and businesses. Infrastructure Victoria has completed a project to assess the benefits of adapting government-owned and -managed infrastructure to the changing climate.

The research demonstrates a replicatable methodology that can help governments decide how, when and where to invest in adapting infrastructure to extreme weather across sectors.

We undertook a statewide climate risk assessment, identifying over 40 climate-related risks and geospatially mapped exposure to climate change hazards. We used these findings to compare the economic case for 20 different adaptation measures for the road and electricity sectors. The economic analysis method modifies the cost-benefit analysis approach to assess floods and bushfire risks to road, and wind impacts on electricity distribution networks.

The analysis found that the benefits of investing in infrastructure adaptation can outweigh the costs of repairing and rebuilding after extreme weather events. Infrastructure can be adapted in many ways and the way it is managed can be changed. The results show that lower cost maintenance and nature-based solutions achieved a higher return on investment. Governments can also benefit from coordinating and sequencing different adaptation measures to help with forward-planning budgets.

As adaptation interventions vary by different asset types and different locations, it is not a one-size-fits-all approach. It is not possible to do everything, everywhere, all at once. Therefore, the best adaptive solutions can be selected for high priority locations by carrying out localised site-specific analysis. The project provides 7 recommendations to help the Victorian Government to better assess and prepare infrastructure for the impacts of climate change, which aim to transform existing governance mechanisms.

Theme

Decisions & governance

S10.3.1

Extreme weather events affect the success of climate adaptation interventions.

Miss Lin Dai¹, Dr Ayesha Tulloch¹, Dr Claire Mason², Dr Rachael Gallagher³

¹Queensland University of Technology, Brisbane, Australia. ²University of Tasmania, Brisbane, Australia. ³Western Sydney University, Sydney, Australia



Miss Lin Dai

Abstract

Impacts of climate change on threatened species are widely reported, accompanied by growing calls for climate adaptation to increase species' resilience. Although certain efforts have successfully improved outcomes for threatened species, little insight has been gained into why failures occur. Shifts in the frequency, intensity and distribution of extreme weather events are increasingly documented as driving management failure. We synthesised evidence from the peer-reviewed and grey literature to learn whether extreme weather impacts the success of climate adaptation interventions for threatened species. We focus on actions that are possible on farms, as agricultural expansion is the dominant driver of global biodiversity loss over recent decades. We identified 176 climate adaptation interventions that were affected by extreme weather events and assessed their effectiveness in sustaining or improving populations of Australia's threatened species. Climate adaptation efforts across about half of Australia's bioregions have been impacted by extreme weather to varying degrees, resulting in mostly negative outcomes for threatened species. Only 9% of interventions reported positive outcomes, usually associated with improved site conditions for reproduction (plants) and foraging (mammals) after above-average rainfall. Species translocation and reintroduction were most often reported as having been negatively impacted by extreme weather. Dryness/drought was the most reported extreme weather affecting interventions. Direct mortality, loss or degradation of habitat, and reduced recruitment were frequent reasons for management failure. Our work highlights the importance of addressing extreme weather impacts when planning and implementing climate adaptation efforts and effectively using climate and weather forecasting throughout the project cycle for successful climate adaptation initiatives. Future research should focus on improving evaluation for the effectiveness of climate adaptation interventions for less-represented taxa such as invertebrates and freshwater fish, as well as in regions with limited data, such as central, western, and northern Australia where extreme weather impacts are already being felt.

Theme

Decisions & governance

S10.3.2

AdaptLog: an adaptation catalogue for conservation

Dr Claire Mason^{1,2}, Dr Alistair Hobday², Dr Jason Hartog², Dr Jess Melbourne-Thomas², Associate Professor Sarah Boulter¹, Dr Ingrid van Putten^{2,3}, Dr Jenny Styger¹

¹University of Tasmania, Hobart, Australia. ²CSIRO Environment, Hobart, Australia. ³ACIAR, Canberra, Australia

Abstract

Conservation management efforts necessarily require a shift from considering intervention and management in a static climate to one that must consider adapting to both long-term climate change and short-term extreme events and seasonal conditions. Sharing approaches to climate change adaptation that have been applied in different systems is important to speed progress in this challenging space. To aid climate adaptation efforts, we present an online, searchable repository of adaptation interventions for species and ecological communities to provide managers with options for on-ground action in the face of climate change. AdaptLog (adapt-log.csiro.au) contains over 400 examples of interventions. We place the process of selecting adaptation interventions on the roadmap of a broader adaptation journey and share approaches to incorporate and consider the wider implications of implementing on-ground adaptation for biodiversity conservation. As a result of co-developing these products alongside conservation practitioners in Australia, we share practical examples demonstrating how this tool can be used to incorporate a climate lens over short and long timescales.

Theme

Adaptation for natural systems, natural systems for adaptation

S10.3.3

Adapting across climate gradients in south-west WA

Dr Leanne Van Der Weyde, Mr Rowan Lymbery, Dr Lesley Gibson, Dr Harry Moore, Ms Hannah Kilian, Dr Kym Ottewell
Department of Biodiversity, Conservation and Attractions, Perth, Australia

Abstract

The biodiversity hotspot of southwest Western Australia (SWWA) has undergone significant climate changes over the past century, resulting in increased dryness and average temperatures, and more frequent extreme events such as heatwaves. With such dramatic and rapid changes, which are projected to continue, many species will need to shift their range or become more tolerant through genetic adaptation. For most species in SWWA, we have no knowledge of whether such processes will keep pace with climate change. Under the climate adaptation initiative of the WA Department of Biodiversity, Conservation, and Attractions, we are testing these ideas in threatened fauna that occur across climate gradients, given some populations of these species already experience hotter and dryer conditions than others, providing a 'window into the future' on how species are likely to respond. Using chuditch (*Dasyurus geoffroyi*) as a case study, I will present our approaches to (1) identify current distributions and predict their changes under climate scenarios, and (2) identify how patterns of gene flow or functional genetic diversity are associated with climatic differences. The outcomes will be used to inform critical conservation activities such as protecting key habitat corridors or refugia, identifying suitable alternative habitats for translocations, and genetic rescue via sharing of adaptive genetic variation.

Theme

Adaptation for natural systems, natural systems for adaptation

S10.3.4

Flatback Futures: Adaptation pathways for a species facing long-term change

Dr Alistair Hobday

CSIRO Environment, Hobart, Australia



Dr Alistair Hobday

Abstract

The Flatback Futures project (2018-2024) focused on developing and evaluating intervention strategies to ensure the long-term survival of flatback turtles in Western Australia. We identified and ranked various interventions based on cost, feasibility, social acceptability, and effectiveness in addressing six primary threats. A population model was developed to estimate the long-term impact of conservation efforts, revealing that young adults contribute most to population growth, though they are the hardest to protect in the wild. The model also highlighted the potential for population crashes due to climate-induced female-biased offspring ratios, which may initially show stability before a delayed decline. Social acceptability of interventions was assessed through surveys of experts and local community members. Interestingly, residents preferred interventions targeting human behavior or the environment, while experts favored direct turtle-focused actions. Understanding these differences is crucial for implementing effective and publicly supported conservation measures. Finally, we explored future climate and development scenarios to help conservation managers plan adaptive strategies. By modeling different conservation pathways, we provided tools for policymakers to anticipate challenges and develop proactive management approaches. These future-proofing strategies are essential for improving conservation outcomes and ensuring the resilience of flatback turtle populations in a changing environment.

Hobday et al (2025). Flatback Futures: Scenarios and adaptation pathways for a marine turtle facing long-term change. *Endangered Species Research* 56: 69-91 <https://doi.org/10.3354/esr01381>.

Hobday et al (2024). Flatback futures - Evaluating conservation interventions to reduce threats to an endemic Australian turtle. *Endangered Species Research* 54: 29-40 <https://doi.org/10.3354/esr01321>.

Richards et al (2024). Identifying impactful sea turtle conservation strategies: a mismatch between most influential and most readily manageable life-stages. *Endangered Species Research* 54: 15-27 <https://doi.org/10.3354/esr01326>.

van Putten et al (2023). Prioritising management interventions for flatback turtles: Understanding social acceptability and preferences from different communities. *Endangered Species Research* 52: 189-201. <https://doi.org/10.3354/esr01273>.

Theme

Adaptation for natural systems, natural systems for adaptation

S10.4.1

Governance and climate change risks: Understanding the multidimensional relationship

Professor Lauren Rickards, Ms Julie Webb
La Trobe University, Melbourne, Australia

Abstract

A better understanding of the relationship between climate change risks and governance is increasingly important given governance plays a critical role in shaping and distributing these risks and our adaptation responses.

To date, the term 'governance risk' has tended to be used in the context of ESG frameworks (environmental, social and governance) or in risk management where poor governance, including of risks, is recognised as a threat to organisations, notably corporations.

The complexity, uncertainty, and contextuality of climate change risks and impacts challenge governance itself in very direct and many indirect ways. Climate change is not only another risk to manage and govern; it is also an influence on these practices themselves. All governing, including of climate change risks and adaptation, has to be undertaken in a more stressed and disrupted environment. This exacerbates existing governance challenges, including how to assess and manage climate change risks, and makes it harder to make decisions that do not lead to ineffective, slow or maladaptive outcomes.

This presentation draws on recent work on 'governance risk' and presents a new approach to understanding the climate change risk and governance relationship. It reflects on risk factors associated with governance risk and an approach to gathering evidence in Australia. In doing so it works towards an understanding of what is needed to adapt governance itself to climate change.

Theme

Decisions & governance

S10.4.2

WA Climate Adaptation Strategy - overview of the Government's adaptation response

Mr James Duggie

WA Dept of Water and Environmental Regulation, Perth, Australia



Mr James Duggie

Abstract

The Western Australian Government is building a more comprehensive climate adaptation response guided by the *Climate Adaptation Strategy* (2023). Building on the *Western Australian Climate Policy* (2020) and existing initiatives, the Strategy is supporting the Western Australian government, industries, cities and regions identify and manage climate impacts and enhance climate resilience. The Strategy identifies four directions to support and accelerate climate adaptation across the state. These include: Produce and communicate credible climate information and resources; Build public sector climate capability and strengthen accountability; Enhance sector-wide and community partnerships to unite and coordinate action; and Empower and support the climate resilience of Aboriginal people. To achieve these directions, the WA Government has committed to 37 priority actions, supported by almost \$40 million. This includes: expanding the Climate Science Initiative; developing adaptation plans for key sectors of the economy; and engaging with Aboriginal leaders and regional communities to share knowledge, and design a new fund for Aboriginal-led adaptation projects that support Aboriginal communities to become more climate resilient. An additional \$2.8 billion has been invested to secure Perth's next major source of drinking water, the Alkimos Seawater Desalination Plant.

Two years into its implementation, this presentation will highlight key progress including how different adaptation actions are working together to create a coordinated and integrated climate adaptation program. The presentation will explore valuable insights, challenges faced, and lessons learned in the journey towards building a more resilient future for Western Australia.

Theme

Decisions & governance

S10.4.3

Directions for climate change adaptation research in Western Australia

Ms Emily Gifford

Department of Water and Environmental Regulation, Joondalup, Australia



Ms Emily Gifford

Abstract

Western Australia covers an area of 2.5 million square kilometres, that's one third of Australia's landmass. The government of Western Australia also has jurisdiction over Western Australia state waters, extending along the 20,000km coastline. Unsurprisingly, the state experiences a spectrum of weather conditions influenced by tropical cyclones in the north and Antarctic cold fronts in the south. This broad geographic expanse means that climate resilience requires an efficient approach.

Western Australia's engagement on climate resilience has increased in recent years, including in the public sector. Climate science, risk and adaptation programs have expanded rapidly on local, regional and state scales. Simultaneously, decision makers are requesting useful and timely research outputs to aid their adaptation planning. Research programs need to avoid duplication and meet high priority needs.

In order to promote adaptation research pathways that address the state's urgent and broad adaptation needs, the Department of Water and Environmental Regulation undertook a one year Adaptation Research Hub program to promote access for end users to information; open lines of communication to connect researchers to end users; and identify research gaps.

The Hub mapped existing research programs and collated a list of desired research outputs. It also identified unique drivers of the adaptation research space such as the need for interdisciplinary research, and the potential for research programs to provide opportunities to groups that are most vulnerable to climate change impacts.

In this presentation we will outline methods and results of the Adaptation Research Hub development phase and discuss how adaptation research may be employed to ensure that Western Australia and other jurisdictions are efficiently enhancing climate resilience.

Theme

Decisions & governance

S10.4.4

Navigating Tomorrow: Achieving a flourishing future in a changing climate

Mrs Erin Burge

Eastern Metropolitan Regional Council, Perth, Australia



Mrs Erin Burge

Abstract

Climate change impacts all of us. Climate change is not just an environmental issue. It's a social issue impacting people's health and wellbeing. It is an economic issue with hundreds of billions of dollars lost through climate related disasters and production losses.

The UN's Sustainable Development Goals (SDGs) provide a global shared blueprint for peace and prosperity. But how do we measure meaningful progress? The Eastern Metropolitan Regional Council (EMRC) has conducted a benchmark review of their progress against the SDGs by using the Future-Fit Foundation's Business Benchmark methodology.

Based on systems science, this methodology is helping businesses around the world understand their impacts on environment, society and economy. System science is concerned with understanding complex systems within nature and society with a focus on holistic views, interactions between systems and environment. With dynamic paths of behaviour, various boundary conditions can become unstable and destructive. Focusing on a range of factors and over 30 years of scientific research, the methodology employed by the EMRC proposes the concept of break-even goals, which is the bare minimum every business needs to reach to avoid undermining society's progress towards a flourishing future.

On the other hand, Positive Pursuits extend above and beyond the Break Even Goals and assist with speeding up society's transition to future-fitness beyond a business's direct operations. It is a balancing act of driving positive impact in one area while ensuring there's no unintended negative consequences on the environment, society and economy.

This presentation will expand on the above concepts using the EMRC's SDG Benchmark Technical Report outcomes and showcase the EMRC's progress on this journey with a strong focus on SDG 13 Climate Change as a priority focus area.

Theme

Decisions & governance

S10.4.5

Identifying adaptation priorities for emergency management: challenges and opportunities.

Dr Neville Ellis

Department of Fire and Emergency Services, Perth, Australia



Dr Neville Ellis

Abstract

Over the past decade, the cost and complexity of climate-related disasters have increased significantly, both nationally and globally. Climate change, demographic shifts, growing reliance on technology, geopolitical tensions, economic pressures, and societal interdependencies have made crises more complex, unpredictable and multifaceted. In response, experts across academia and policy have observed that systemic risks—interconnected, compound, cascading, and concurrent—are now the norm rather than the exception. Relatedly, in Western Australia, efforts are underway to identify climate change adaptation priorities for the emergency management sector as part of broader state government initiatives to enhance climate resilience. Typically, adaptation priorities are identified through climate risk assessments which help determine key hazards (and their climate influences), exposures, and vulnerabilities. While valuable in many contexts, we argued that systemic risks – particularly those driven by climate change – represent a significant expansion of the problem space of emergency management which do not lend themselves to traditional, reductive risk assessment methodologies. In response, we explore how sector-level adaptation priorities can be identified in ways that strengthen the general resilience of the emergency management sector. These priorities focus on enhancing the sector's capabilities and capacities to manage increasing uncertainty, novelty, and complexity. We also consider the broader implications for risk assessment and policy within emergency management.

Theme

Understanding & assessing hazards & risk

S10.4.6

The role of local governments in adapting to climate-related risks

Dr Estefania Arteaga¹, Mr Donovan Burton²

¹World Adaptation Science Programme, Gold Coast, Australia. ²Informed.City, Brisbane, Australia

Abstract

Local governments are at the frontline of climate adaptation, facing increasing challenges from climate-related physical and transition risks that extend beyond emissions reduction. While transition risks are commonly associated with energy transitions and carbon-intensive industries, a critical gap remains: the failure to recognise transition risk in climate adaptation. While, acute and chronic climate events will fundamentally alter asset management, financial planning, and the provision of essential services, the transition to a low carbon and resilient future also presents a number of risks that must be explored (e.g. insurance, litigation, market, technology risks).

Research highlights that climate-related risks are multifaceted, encompassing acute risks such as extreme weather events (IPCC, 2022) and chronic risks such as rising sea levels and prolonged droughts (Hauer et al., 2020). These risks necessitate proactive financial planning and governance structures within local governments. Furthermore, transition risks associated with adaptation and transition have been overlooked, resulting in governance blind spots that threaten resilience and service continuity (Carney, 2015). A failure to incorporate these risks into local government planning could lead to significant economic losses, as highlighted by recent case studies in municipal climate resilience (Mehryar & Surminski, 2021).

The session will explore how local governments identify climate-related risks and address transition risks from an organizational perspective. The session will highlight the need for comprehensive climate-related risk assessments that transition risk as a whole. The panellists will discuss best practices, methodologies for assessing risks, and case studies of local governments integrating climate adaptation into financial and operational planning.

Theme

Understanding & assessing hazards & risk

S10.5.1

Understanding climate risk - co-designed applications for local decision making

Mr Timothy Boyle

University of Tasmania, Hobart, Australia



Mr Timothy Boyle

Abstract

Despite the availability of future climate projections at various levels across Australia, there is a large gap between future climate projections and decision-ready actionable intelligence. Extreme events such as heatwaves, bushfire, storms, and floods impact communities, infrastructure and biodiversity particularly when these events compound or cascade, posing challenges for local communities' emergency management.

As these compound events are so impactful, decision makers are asking if they will get more of these in the future, if they will be worse, and/or closer together in space and time.

Climate projections alone can't tell us this, it needs expert interpretation of the future climate information, multiple lines of evidence, and critically, we need to understand how decision makers specifically need to use this information.

This project explores specific place-based user applications across Australia, co-designed with four state/territory, local government partner organisations (Noosa and Sunshine Coast councils, Glenelg Hopkins CMA, ACT government) to further understand their regional compounding climate hazards and inform adaptation planning. Each partner organisation's approach to climate change impact scenario planning are also captured as case studies for assessment of best practice principals to co-designed adaptation strategy.

Theme

Understanding & assessing hazards & risk

S10.5.2

Co-designed narrative climate scenarios for the ACT Government

Mr Timothy Boyle¹, Ms Natali Koerbel²

¹University of Tasmania, Hobart, Australia. ²ACT Government, Canberra, Australia



Mr Timothy Boyle



Ms Natali Koerbel

Abstract

Despite the availability of future climate projections at various levels across Australia, there is a large gap between future climate projections and decision-ready actionable intelligence. In the ACT, extreme climate events such as heatwaves, bushfire and smoke impact communities, infrastructure and biodiversity particularly when these events compound or cascade with additional climate hazards and other macro drivers, posing challenges for local communities' emergency management.

S10.5.4

Ag2050: Enabling future-focused conversations with scenarios and design thinking

[dr cara stitzlein](#)¹, Dr Ashlin Lee², Dr Claire Naughtin³, Dr Rose Roche²

¹csiro, sandy bay, Australia. ²csiro, Black Mountain, Australia. ³csiro, Dutton Park, Australia

Abstract

Adaptation to climate change requires us to develop strategies across different time horizons through which different possible futures are considered. Thinking through anticipated trade-offs and consequences of events that haven't yet occurred is challenging, as is aligning diverse groups of stakeholders to drive transformative system-level shifts. Having productive ways to discuss possible futures with one another and drive necessary actions is needed.

At CSIRO, we are addressing this need through a multi-year, multidisciplinary programme of work called Ag2050. Focused on possible adaptation pathways within Australian Agriculture, this work is designed to explore what we need to do to create a more productive, resilient and sustainable future for Australia's farming systems.

In this presentation, we share four scenarios of what 2050 may look like, ranging from the possibility of Australia's agricultural innovation system reaching its full potential to other scenarios that reflect fewer desirable endpoints. Co-developed with industry, government and academic partners, the scenarios are meant as conversation starters for individual farm, community and industry-scale discussions.

We will also share the recent engagements we have run with researchers, industry groups and policy stakeholders to help them apply the Ag2050 scenarios in their decision-making spheres. Here, we augment the scenarios with design-led techniques to increase the saliency and relevancy of future possibilities for specific contexts and stakeholder groups. We have found that this allows stakeholders to be increasingly responsive, imaginative and collaborative when considering how they might respond to climate-related impacts and issues, helping to create a shared responsibility around system-level challenges at the intersection of agriculture and climate change.

Theme

Tell it, talk it

S10.5.6

Leveraging scenario analysis for climate risk assessments and mandatory disclosures

Mr Abhi Ganugapati¹, Ms Nikala Passaris², Dr Ashley Whitt¹, Mr Mayuran Sivapalan³

¹Adaptus, Melbourne, Australia. ²Adaptus, Brisbane, Australia. ³Adaptus, Perth, Australia



Mr Abhi Ganugapati



Ms Nikala Passaris



Mr Mayuran Sivapalan

Abstract

Keywords: scenario analysis, hazard assessment, compounding risks, uncertainty management, strategic planning

The Australian landscape for climate risk assessment is rapidly evolving, with mandatory disclosure requirements now highlighting the need for robust hazard and risk evaluation methods. Scenario analysis provides a systematic approach for assessing complex, compounding climate risks while accounting for deep uncertainty in future conditions. This presentation demonstrates how organisations can effectively deploy scenario analysis to identify, assess, and prepare for multiple climate hazards simultaneously.

Drawing on case studies from the energy and insurance sectors, we illustrate methodologies for developing scenarios that capture potential extremes in future climate states. Our approach combines qualitative narratives with quantitative climate modelling to reveal how different hazards may interact and cascade across organisational systems. By articulating distinct but plausible futures, organisations can better anticipate compounding and systemic risks that traditional single-hazard assessment methods might miss. The methodology specifically addresses how organisations can identify trigger points where climate hazards become material risks, allowing for more strategic adaptation planning. We demonstrate practical techniques for overcoming analytical biases, particularly the tendency to underestimate compound hazard interactions and cascading effects across value chains. The approach helps organisations move beyond assessing individual climate hazards in isolation to understanding systemic vulnerabilities across their operations.

Delegates will learn how to assess physical and transition risks across multiple scenarios, challenging traditional consequence frameworks to better account for compounding effects and non-linear impacts. This comprehensive approach to risk assessment enables organisations to identify adaptation priorities that address multiple hazards simultaneously, supporting more robust resilience planning in the face of significant climate uncertainty.

Theme

Understanding & assessing hazards & risk

S11.1

The Adaptation Game Canning: serious games for community climate adaptation

Mr. Ben Pederick¹, Ms. Rachel Williams²

¹Deakin University, Melbourne, Australia. ²City of Canning, Perth, Australia



Mr. Ben Pederick



Ms. Rachel Williams

Abstract

In a joint presentation The City of Canning and The Adaptation Game (TAG) will explore the potential of immersive storytelling as a tool for climate resilience in this unique interactive session.

They will present and then play TAG, an in-person simulation designed to help communities experience and respond to local climate challenges and transform awareness into action.

Canning first encountered TAG at the Adaptation Conference in Adelaide in 2023. Now 2 years later they have just completed the localisation of TAG Canning.

First, we will hear from one of TAG's founders who will explain what it is and how it works with councils and communities. Then Canning's Coordinator Sustainability Development will give the council's view on TAG. They will explain how they generated support and then created TAG Canning.

Then we will play TAG Canning, with audience members as players for a journey into the near future of climate risks and adaptation of Canning. This immersive experience will use scenarios and storytelling to educate and empower community-based climate resilience building. Players and audience will bring their expertise to a context of real-life agency at community scale.

TAG is now in 25 councils, including in Australia, New Zealand and Canada. It is gathering momentum as a tool for local governments to engage and mobilise coordinated community climate action. Join us to experience how immersive games and storytelling can foster community-based adaptation action through The Adaptation Game.

Theme

Tell it, talk it

S11.2

Climate Resilience Districts - a framework for adaptation implementation

Dr Michael Spencer¹, Dr Tamara Wilkinson¹, Mr John Marinopoulos²

¹Monash University, Melbourne, Australia. ²Value Advisory Partners, Melbourne, Australia



Dr Michael Spencer



Dr Tamara Wilkinson



Mr John Marinopoulos

Abstract

Localism is at the core of adaptation. Climate impacts vary across localities. Those localities do not respect jurisdictional boundaries. Impacts cross multiple institutions. They do not fall neatly within the domain of any single agency. Literature emphasises the importance of local bottom-up adaptation that includes multiple voices. Localities have different values and priorities. Communities are looking for local leadership that no single institution can provide. Responding to the challenges of a 2°+ world requires new institutions that can cross jurisdictional boundaries, transcend institutional silos, provide local governance and bring together multiple stakeholders. Local governance will not achieve change unless it receives; (1) recognition and legitimacy, (2) support from the best available science for decision-making, and (3) access to finance.

In different parts of the world, these governance arrangements have different names. This panel will consider the potential application of U.S. Climate Resilience Districts (CRDs) to Australia. Legislation in California and Maryland grants authority for cross-jurisdictional legal entities (CRDs); joint ventures of cities and counties, tribal districts and others in affected areas to undertake adaptation investment. State and federal agencies provide training and technical support. Legal status allows CRDs to receive funds from government and the private sector. They can use tax increment financing (growth in property tax from lower risk), special taxes, property service fees, grants, gifts and bonds. Innovative private sector finance is of growing interest. CRDs have support from insurers because they lower climate risks.

This panel session will introduce the concept of CRDs and current work to develop the concept led by the National Academy of Public Administration (NAPA). Drawing on a multidisciplinary team, it will lead discussion through the elements of governance, local risk assessment and finance (public and private) to explore potential application to Australia.

Theme

Decisions & governance

S11.3

Embedding nature as a climate adaptation solution in Australia

Ms Sarah Hoyal¹, Dr Rachael Morgain^{2,3}, Dr Bek Christensen²

¹NRM Regions Australia, NSW, Australia. ²NRM Regions Australia, Moruya, Australia. ³University of Melbourne, Victoria, Australia

Abstract

Globally, Nature-based Solutions (NbS) has emerged as a critical and innovative approach to tackling the dual nature and climate crises. In Australia, current funding directed to NbS is small scale and short term, with most focussed on meeting Nature Positive targets. Rather than investing in disaster resilience, approximately 97% of disaster funding is directed to response and recovery from the increasing number of extreme events that Australia is experiencing. With the right enabling environment, there is an opportunity to meet multiple government objectives across portfolios with NbS. There also remains a need to support private sector co-investment that holistically addresses the funding shortfall for disaster preparedness and climate adaptation.

This session will be facilitated by NRM Regions Australia (NRMRA) and draw inspiration from global NbS examples. A panel of diverse stakeholders will focus on identifying strategies to embed and deploy NbS across Australia as a means of mitigating climate change risks, building disaster resilience, and supporting adaptation. This session will link onground practitioners, the finance sector and policy makers. The 54 regional NRM organisations represent a unique national infrastructure of interlinked, regionally embedded expertise and capability for improving landscape resilience. They work through local networks and communities to strengthen management of biodiverse ecosystems and other natural resources. With increased exposure to natural hazards, many organisations now embed disaster resilience more explicitly into their core planning and programs.

Proposed approach: NRMRA provides regional NbS examples, highlighting barriers/ opportunities in short video presentation; followed by speaker panel invited from a range of organisations including Climate-KIC, Green Cross Australia, WWF-Pacific, IGCC, Treasury, NEMA, DFAT, DCCEE, CMI, BCSD, ICA, NHRA, Indigenous speakers; followed by audience participation.

Theme

Adaptation for natural systems, natural systems for adaptation

S11.4

Measuring what matters: how Australian jurisdictions are tackling adaptation MERI

Mr Kieran Power¹, [Ms Leah Rheinberger](#)²

¹Nation Partners, Melbourne, Australia. ²Department of Water and Environmental Regulation, Perth, Australia

Abstract

Monitoring, Evaluation, Reporting, and Improvement (MERI) provides a structured approach to ensure the effectiveness and efficiency of adaptation initiatives, enabling continuous learning and improvement to better address the impacts of climate change. This is increasingly important as more organisations seek to roll out flexible approaches to climate adaptation planning, such as Dynamic Adaptive Policy Pathways (DAPP) and the Resist-Accept-Direct (RAD) framework, as these require careful tracking of key tipping points and decision thresholds.

Despite the importance of MERI in adaptation, development and implementation of robust context-specific MERI frameworks is an emerging field. In recent years, adaptation MERI has been a focus within governments across Australia, with several jurisdictions currently developing and implementing adaptation MERI approaches tailored to their specific context. In this session we will hear from government agencies across Australia at varying stages of their adaptation MERI journeys. Through an interactive panel discussion, we will explore:

- Why implementing adaptation-focused MERI is important in different contexts.
- Gaps between theory and practice, including specific challenges undertaking MERI for climate adaptation relative to other fields.
- Examples of leading practice globally and how Australian jurisdictions are building on these.
- Practical examples of how adaptation-focused MERI efforts are driving improved outcomes in areas such as investment cases and adaptation pathways planning.
- Techniques used to engage and obtain buy-in from key stakeholders.
- Innovative approaches taken to developing key MERI elements, such as program logics, metrics, indicators and assessment rubrics.
- What could this space look like in five years and how can we get there together.

Theme

Decisions & governance

Enhancing Climate Resilience through the Holistic Exposure Assessment Tool (HEAT)

Mr Clinton Rakich¹, Mr Adam Garthwaite²

¹TSA Riley, Perth, Australia. ²TSA Riley, Hobart, Australia

Abstract

In the face of escalating climate hazards, the need for comprehensive and adaptive tools to assess and mitigate risks has never been more critical. The Holistic Exposure Assessment Tool (HEAT) is an innovative solution designed to provide a transparent and flexible approach to understanding material considerations across climate, nature, and water for any asset portfolio. Developed by TSA Riley, HEAT enables clients to easily assess and interrogate geospatial information, thereby identifying key risks and opportunities to employ nature-based solutions that buffer assets from climate hazards and enhance resilience while delivering an array of co-benefits.

HEAT offers two primary modes of interaction: reporting workflows and data exploration. The reporting workflows are designed to meet relevant standards such as the Australian Sustainability Reporting Standards (ASRS), the New Zealand Climate Standard (NZ-CS), and the Taskforce on Nature-related Financial Disclosures (TNFD), ensuring auditable and compliant assessments. The data exploration mode allows for free exploration and summarization of data across various views, including specific assets, regions, hazards, or entire portfolios. This flexibility ensures that HEAT can be tailored to meet project and sector-specific needs.

The tool's core strength lies in its ability to integrate and visualize data on dependencies, impacts, risks, and opportunities (DIROs), providing a holistic assessment that highlights critical links, interdependencies, and adaptive opportunities. By consolidating environmental data across climate, water, and nature, HEAT empowers organisations to connect knowledge and make informed decisions that build a more resilient, nature-positive enterprise.

HEAT's adaptability extends to its system design, developed as a Power BI App, allowing for co-design and customization to meet specific requirements. This ensures that new datasets can be easily integrated as they become available or required by evolving standards.

Join us at the Climate Adaptation 2025 conference to explore how HEAT can transform your approach to climate resilience and sustainability.

Theme

Understanding & assessing hazards & risk

Animating Our Future: Climate Change Explained

Mrs Marcela Rosero, Mrs Eilidh Wilson

Murraylands and Riverland Landscape Board, Murray Bridge, Australia



Mrs Marcela Rosero



Mrs Eilidh Wilson

Abstract

The Murraylands and Riverland Landscape region is a unique and special region, defined by the River Murray, its diverse ecosystems and resilient communities that call it home. Climate change is rapidly transforming our region, so we must act now to protect our way of life and ensure a sustainable future. The landscape board has developed two animations videos to highlight the regional changes from the perspective of the species and communities experiencing the impacts of climate change.

Animation 1 covers the changes that have been happening across the region, which include an increasing pattern of droughts, floods and biodiversity loss. By 2050 the impacts of climate change will cause pest species to multiply, bushfires will become more intense, there will be less water for people, production and the environment and there will be more heat waves. Ecosystems as we know them are changing permanently. (Length = 60s)

Animation 2 acknowledges the impacts that climate change is causing across our landscapes, and touches on some of the ways the landscape board is partnering to deliver adaptation actions to support our landscapes and communities to be climate ready. Putting people at the heart of landscape management supports strong connections with our communities, First Nations and youth groups. North of the River Murray, the removal of unnecessary pastoral dams supports the restoration of landscape connectivity; along the Murray itself we are using environmental water in wetlands to restore the natural wetting and drying cycle. Across our productive landscapes, the landscape board supports land managers to improve soil health, and to manage water use sustainably. The animation closes on a positive note, that by working together we are stronger, and invites the viewer to support us on the journey.

(Length – 90s)

Adaptfest Video Link

V1: <https://f.io/tgRk2W9k> V2: <https://f.io/mt8obeCq> V2: <https://f.io/mt8obeCq>

Theme

Tell it, talk it

BE CALM: Connecting Nature and Community to Navigate Climate Anxiety

Dr Malcolm Johnson

Huon Valley Council, Huonville, Australia

Abstract

This film introduces the BE CALM initiative from Huon Valley Council, a pioneering approach addressing the intersection between climate communication and emotional well-being in lutruwita/Tasmania. Through powerful testimonials and community experiences captured in our AdaptFest video, we demonstrate how fostering connection to place creates pathways for meaningful climate dialogue and action.

The BE CALM initiative responds to growing climate anxiety, particularly among young people, by creating spaces where emotional responses to climate change can be acknowledged and channelled into constructive engagement. The video showcases community members' authentic voices sharing how nature connection provides both solace and motivation, challenging dominant narratives of climate despair with lived experiences of empowerment through collective action and place-based connection.

Our approach integrates diverse knowledge systems by valuing traditional ecological knowledge alongside contemporary climate science, recognising that effective climate communication must engage both heart and mind. The video highlights how stepping into natural environments—from ancient forest groves to flowing rivers—facilitates different types of knowing and creates common ground for climate conversations across diverse community perspectives.

This video demonstrates how local governments can facilitate climate communication that nurtures emotional resilience rather than reinforcing anxiety. By documenting the impact of the BE CALM initiative, we demonstrate how community-centred dialogue that acknowledges the emotional dimensions of climate change can build confidence for adaptation decisions while fostering intergenerational connections crucial for sustained climate action.

The BE CALM framework offers practical insights for other communities seeking to integrate emotional well-being into climate communication strategies. By sharing this initiative's development and implementation, we contribute to evolving practices in climate communication that honour different ways of knowing and support communities in navigating both the practical and emotional dimensions of climate adaptation.

Adaptfest Video Link

<https://youtu.be/aONoPAnqZOY>

Theme

Tell it, talk it

Climate adaptation approaches for managing World Heritage Gondwana Rainforests (Qld)

Ms Ellen Weber¹, Assoc Prof Sarah Boulter², Cr Claire Mason²

¹Qld Government, Cairns, Australia. ²University of Tasmania, hobart, Australia

Abstract

Climate change is one of the most significant threats to Australia's World Heritage properties, from coral bleaching to increasingly frequent and unprecedented bushfire events; impacting their Outstanding Universal Value (OUV), including their integrity and authenticity, and their potential for economic and social development. These protected areas also hold significant biocultural values.

The Department of the Environment, Tourism, Science and Innovation received an Australian Heritage Grant to undertake a Climate Change Adaptation and Integration Plan for the Queensland section of the Gondwana Rainforests of Australia World Heritage Area (GRWHA).

We discuss two recognised methodologies to assess climate vulnerability and risk assessment for Australian World Heritage Properties -the Climate Vulnerability Index (CVI) and the CSIRO Climate Change Toolbox. The two methodologies utilise similar processes in that they rely on using scientifically verified climate data and trends. They both engage subject matter experts, rely on targeted, facilitated multi-disciplinary workshops to define World Heritage values and attributes, identify knowledge gaps, and determine projected impacts from climate change.

We determined the top three climate change drivers most likely to impact the key values of the GRWHA to 2050; their potential impact and the adaptive capacity in relation to these drivers.

Key initiatives include establishing governance arrangements with First Nations Peoples and stakeholders; climate scenario development, identifying climate change impacts; and prioritising actions for integration into on-ground (QPWS) park management planning and managements such as fire, pest, visitor, monitoring, research and asset management.

We recognise the need to improve opportunities for First Nations peoples' land management knowledge systems and practices. The Yugambeh, Yuggera Ugarapul and Githabul peoples want authentic involvement, as partners, to access, protect and care for their Country and culture, including leadership in climate adaption solutions.

Theme

Adaptation for natural systems, natural systems for adaptation

Power to the Future - Film about the program

Ms Suzanne Dunford, Ms Alejandra Torres
Waverley Council, Sydney, Australia

Abstract

Power to the Future program is an intergenerational program on climate change for local students and Seniors to translate ideas, new knowledge, skills, and energy to influence decision-makers and help the local community to implement tangible and effective climate actions. Thanks to all our amazing participants.

This project has been delivered in collaboration with Amnesty International, Transition Bondi, The Wilderness Society Eastern Side Group, Plastic Free Bronte, UTS Climate, Society and Environment Research Centre, Jewish Sustainability Initiative and Climate Fresk. This project has been assisted by the NSW Government through its Environmental Trust

Adaptfest Video Link

<https://www.youtube.com/watch?v=kZ-mipc2DSI>

Theme

Tell it, talk it