

# Climate Change Risk Assessment for the ACT

Summary 2022



### **Acknowledgement of Country**

#### Ngunnawal Acknowledgement

Dhawura nguna ngurumbangu gunanggu Ngunnawal Nginggada dindi dhawura Ngunnawalbun yindjumaralidjinyin Mura bidji mulanggaridjindjula Naraganawaliyiri yarabindjula.

#### Ngunnawal Language Acknowledgement Translation

This country is Ngunnawal peoples ancestral, spiritual homeland We all always respect elders, male and female, as well as Ngunnawal country itself They always keep the pathways of their ancestors alive They walk together as one.

#### **ACT Acknowledgement**

The ACT acknowledges the Ngunnawal people as Canberra's first inhabitants and Traditional Custodians of Ngunnawal Country. We recognise the special relationship and connection that Ngunnawal people have with this Country. The Ngunnawal people are a thriving people whose life and culture is connected unequivocally to this land in a way that only they understand and know, and is core to their physical and spiritual well-being.

The segregation of the Ngunnawal people from Culture and Country has had long-lasting, profound and ongoing health and well-being effects on their life, cultural practices, families and continuation of their law/lore. We acknowledge the historic dispossession of the Ngunnawal people of Canberra and their surrounding regions. We recognise the significant contribution the Ngunnawal people have played in caring for Country. For time immemorial they have maintained a tangible and intangible cultural, social, environmental, spiritual and economic connection to these lands and waters. **ACT Climate Change Risk Assessment** 

## Executive Summary

Climate change is creating a more unpredictable and potentially turbulent setting for the Australian Capital Territory (ACT) Government and the communities and businesses it serves, through the prevalence of increased extreme heat days, more frequent and intense extreme weather events, and extended periods of drought conditions.

AECOM was commissioned by the ACT Government to undertake a Climate Change Risk Assessment to identify and assess physical climate-related risks for ACT Government services, operations and assets, and identify opportunities to improve resilience across the risks identified. This report captures key insights and conclusions to aid the ACT Government's understanding of the implications of climate change and key issues that need to be addressed at the 'whole-of-government' level to manage these risks.

## Methodology and stakeholder engagement

The climate change risk assessment took a four-phase approach:



## **Climate context**

A summary of climate change projections by 2045 under an RCP8.5 model mean (and maximum) scenario are outlined below.

# +1.6°C

Higher average temperatures, with an increase of about 1.6°C in both the average minimum and maximum daily temperatures by 2045 compared to the 2000 baseline, increasing to about 2.7°C By 2070.



A change in **annual rainfall** by 2045, although there is variability between the different projection models from a 7% increase in annual rainfall to a 12% decrease in annual rainfall (on average reducing by 2%).

# 6 more days above

A shift towards **extreme heat days** with, on average, at least 6 more days above 35°C each year by 2045, increasing to 13 more days by 2070.



A shift away from **cold days** with, on average, more than 29 fewer days below 2°C each year by 2045, increasing up to 47 fewer days by 2070.

## Increased extreme rainfall events

Regardless of the change in average rainfall, there is expected to be an **increase in extreme rainfall events**, which will also account for a greater portion of all rainfall (i.e. on those days when it does rain, it is likely to be more intense, even if there are fewer days when it rains). Rainfall will likely decrease in winter and spring, but increase in summer



The ACT is projected to experience an increase in average and severe **Forest Fire Danger Index** days (FFDI – used to quantify fire weather by combining observations of temperature, humidity and wind speed), increasing by about 3 severe FFDI days every decade, with the increases mostly in spring and summer (peak fire season) and highest in the northern ACT.

### **Resulting in:**

- Increased pressure on healthcare, emergency response and recovery services
- Water storage impacts
- Lost productivity for business, increased workplace claims
- Decreased financial stability
- Increasing mental health concerns
- Loss of wildlife habitat and biodiversity, reduced stability of alpine and subalpine environments

Damage and disruption to electricity and transport infrastructure

- Poorer health outcomes from vulnerable community members
- Increased housing costs due to unsafe and unhealthy living conditions for vulnerable community members
- Reduced thermal comfort within buildings and communities.

## **Assessment-wide findings**

Climate change will impact all ACT operations and services, however there is generally good awareness of these impacts, with the following key findings identified:

- The institutional framework for adaptation in the ACT has the potential to deliver effective action, compared to other jurisdictions in Australia. With its single level of government structure, relatively small geographical area and population, and condensed urban areas (in relation to the wider Territory), opportunities to invoke transformational change are numerous.
- The ACT Government has good examples of frameworks in place and established experience in managing physical impacts associated with climate change. Agencies respond quickly to extreme weather events and initiatives, and programs have been developed at a range of scales to support preventative and adaptive responses. There are many opportunities to consider physical climate risk in a more consistent and cohesive way across the whole of government, to ensure efforts are aligned.

The following infographic demonstrates the climate change impacts The ACT could face in the near future.

- The ACT Government has a role in enabling, facilitating and supporting private sector adaptation. Given that a large proportion of adaptation action is expected to be delivered by the private sector, providing resilient infrastructure (ICT, power, transport and water) is crucial in enabling businesses to minimise disruptions to their operations from climate change risks.
- Actions should be targeted towards prevention and reducing the occurrence of the hazard (or exposure to the hazard) in the first place, rather than in the response and recovery phases of shock events. Strategic land use planning is seen as the single most important type of intervention.
- Addressing risks requires the capacity to consider them from a system-wide perspective. The approach of looking at climate risks across value domains enabled the break-down of typical silos that have become evident across ACT Government in addressing these risks. Further cross-Directorate engagement is



needed to expand the horizon of adaptation actions to suggest more fundamental or transformational changes. The project has identified opportunities for Directorates to learn from one another and adopt approaches already tested.

- The impacts of climate change will be amplified by interdependencies between risks and other underlying shocks and stresses. Understanding of these interdependencies by Government is less comprehensive, and current governance arrangements mean that responsibilities for assessing and managing risks from interdependencies are unclear.
- Dependence on interstate and international supply chains, distribution networks and global markets means ACT residents and businesses are exposed to many extreme weather risks that may not occur within the ACT itself. Given that climate change is expected to increase the risk of weather-

related disruptions for supply chains and distribution networks, further work is needed to understand these dependencies and develop cross-jurisdictional collaboration.

- Given that the ACT is a captive insurer, insurance concerns are a key risk for the Government as it operates within global re-insurance markets. Concerns relating to insurance in the private sector have also been highlighted throughout this assessment. Future insurance arrangements are uncertain and are likely to contribute to public and private financial vulnerability.
- Interdependencies between each of the priority risks were reviewed to identify priority risks across all domains, and potential impacts on Wellbeing Indicators within the ACT Wellbeing Framework. The indicators most greatly impacted by the most risks are access to services, followed by liveable city, overall health, and healthy and resilient natural environment.



## Key risks identified across five value domains

The report outlines risks in the context of five 'domains' (social, economy, natural environment, built environment and governance) which represent groups of values, assets and systems that may be at risk from climate change-related hazards. Overall, 26 priority risks from a total of 59 total identified risks have been assessed by this project.



#### 59 risk statements

Risks are considered a 'priority' if they were identified by stakeholders in the preliminary risk assessment phase (and re-validated during all subsequent workshops) as particular areas of consequence, interdependency, and impact.

Extreme risks and risks with a high number of dependencies should be prioritised for adaptation, as improvements in the resilience to these risks are likely to also improve resilience to their interdependent risks. The following section highlights nine risks:

Six of these priority risks have an extreme risk rating due to their potential severe consequence.

A further three risks have strong interdependencies with other risks, indicating that they are drivers or can exacerbate climate change impacts across multiple domains. These risks are presented in the following section, including proposed actions to mitigate their impacts, as identified by stakeholders. Current actions that are already underway by Directorates to manage each risk are collated within the report.

## Built Environment Risk •

Extreme weather events leading to damage or disruption of infrastructure and assets resulting in reduced capacity of Government services (e.g. education, healthcare, etc.).



### **Risk-level adaptation actions**

- Provide guidance for asset managers on incorporating resilience into their asset management plans as per Infrastructure Australia's Pathway to Resilience.
- Update floodplain management plans to account for increased flooding due to climate change and avoid land use in at-risk areas.
- Develop an integrated government approach to share critical equipment in emergency events e.g. power generators.
- Include climate change considerations in repair and maintenance planning, and the design and delivery of new infrastructure.
- Preserve floodway areas of floodplains to reduce flood risks presented to both people and property.
- Update Environment Management Plan Guidelines with climate change considerations.
- Implement changes to building/development codes to make assets more resilient to storms and to increase urban permeability to reduce flash flood impacts.

## Economy Risk O

More extreme weather events leading to economic damages, lost productivity, increased business costs and reduced viability of businesses resulting in compromised economic prosperity of the ACT.



#### **Risk-level adaptation actions**

- Government to work with insurance industries to facilitate fast turnaround of insurance claims, identify options for underinsured businesses and share claims data for better understanding of exposure.
- Economic modelling to understand climate change related financial impacts and mitigation options/priorities.
- Publish communication and guidance on managing climate risks and diversification for businesses.

## Social Risk O

Extreme weather events and longerterm changes in climate leading to adverse impacts upon vulnerable community members resulting in poor health outcomes and increased demand on health services.

### **Risk-level adaptation actions**

- Further support low-income home upgrades for existing poor housing stock.
- Implement minimum energy efficiency standards for rentals.
- Develop and enforce stricter guidelines for new developments.
- Introduce more cool zones in urban areas.



Potential severe consequences



Cumulative extreme weather events and other societal stresses leading to an increase in mental health issues resulting in poor wellbeing within the ACT and increased demand on health services.



#### **Risk-level adaptation actions**

- Employ health economists within the ACT, to lead the measurement and analysis of preventive health measures.
- Recognise other drivers of mental health concerns in the ACT.
- Investigate how the ACT Government should prioritise support for underinsured residents.
- Increase funding towards preventative health measures.
- Review the ACT Government's long-term mental health model and increase child and youth support services and clinical services.

## Social Risk O

Poor air quality (e.g. bushfire smoke, dust storms, thunderstorm asthma) leading to an increase in hospital admissions resulting in increased acute strain on the ACT health services.



#### **Risk-level adaptation actions**

- Identify smoke-proof assets as refuges (including for government business to take place.
- Retrofit program for government assets (such as schools, offices) to control smoke/poor air quality (sealing buildings, air filtration & ensure new buildings are smoke proof).
- Review the current processes and equipment for air quality monitoring to identify opportunities for improvement.
- Implement Bushfire Smoke and Air Quality Plan & increase resourcing to broaden to include long term strategy in future years to consider hazard management planning (i.e. considers land use & development controls, government assets etc).

## Natural Environment Risk O

Increasing temperatures and changing frequency and intensity of bushfires leading to longer, more intense fire seasons resulting in elevated environmental losses and ecosystem disruption.



#### **Risk-level adaptation actions**

- Trial new firefighting techniques.
- Research indirect impacts of bushfires to both the natural environment and on communities.
- Invest in management of weeds and pests to build ecosystem resilience.
- Incorporate future climate risk into bushfire planning and investigation of strategic planned burning approaches.

Potential severe consequences

Strong interdependencies with other risks

## Natural Environment Risk O

Changes in climate (temperature, rainfall, drought and snow cover) leading to negative changes in the composition and stability of alpine and subalpine environments resulting in a loss of these ecosystems.



#### **Risk-level adaptation actions**

- Invest in monitoring and research to better understand risks to alpine ecosystems and how to build resilience or support their transition.
- Develop adaptation plan incorporating future scenarios for alpine and subalpine ecosystems.
- Explore corporate investment options to bolster funding to protect ecosystems.

## Governance Risk O

Extreme weather events and poor air quality leading to increased human safety concerns resulting in high and consistent demand for response and recovery services across directorates.



#### **Risk-level adaptation actions**

- Further focus on multi-hazard response planning for emergency services, including partitioning of workforce and the role of volunteers.
- Provide additional resourcing to manage future demand.
- Whole of government visibility of emergency response plans to ensure consistency and understanding across plans.
- Improve understanding of evacuation management needs for land use planning.
- Improve modelling of flood inundation (beyond 1% AEP) and future conditions for emergency planning.

### Governance Risk •

Cumulative impacts of climate change and extreme weather events leading to increased stress and pressure on whole of government response including healthcare and social services.



#### **Risk-level adaptation actions**

- Improve whole of Government visibility on business continuity plans to ensure consistency and understanding across plans. Development of a framework to assist in prioritising resources during concurrent events.
- Develop a framework and communicate the support available during disaster events to provide the community some certainty and reduce community stress.
- Conduct a review of emergency preparedness in building new infrastructure and operations to ensure appropriate plans in place.
- Provision of additional programs to support the mental health of the volunteer network and vulnerable sectors.
- As the numbers of patients and demands on health services increases, support the needs of the future workforce, increasing patients and user demands of health services through the provision of more staff, resources and better infrastructure.

Potential severe consequences

Strong interdependencies with other risks

## Risk management maturity

Overall, it was found that for major climate hazards, preparations for future drought conditions are likely the most progressed, followed by bushfire, extreme heat, flood, and storms. There is a strong need to improve the ACT's understanding of future exposure of assets and services to climate hazards through the incorporation of climate projections into mapping and planning (e.g. flood prone areas, bushfire prone areas). Investment in assets, services and operations should be the next focus.

Within domains, climate change considerations are becoming most embedded within conservation planning, biosecurity, and water supply planning. Key areas for greater investigation and investment include future proofing housing stock and health systems and improving governance arrangements between directorates. Preparation for risks within the economy domain are broadly showing low maturity and will require further investigation. Additional planning for economic risks will support risk management across all other domains. Further work is required to clarify how land use planning will need to shift to support climate adaptation and how the ACT government can improve services such as for residents in public housing, to support particularly vulnerable community members. Following extreme events, most notably bushfires in the summer of 2003 and 2019/20, there is evidence that significant adaptation steps have been implemented, or are underway, across Directorates, however current reporting is incomplete and inconsistent. Across the directorates, major barriers identified included resourcing (staff and budget), gaps in technical understanding, and a lack of common framework. The majority of respondents noted that their organisation had been affected by climate-related events previously, and some have observed significant impacts on the mental health of ACT Government staff.



## Whole of government adaptation actions

In addition to risk-level actions, the project has also identified domain-wide actions (actions identified that go some way in managing risks across an entire domain category) and whole of government actions (overarching actions. This will enable adaptation across all directorates and all domains).

Highlighted Whole-of-Government actions include:



- Develop a framework and guidance to undertake Directorate-level climate change risk assessments and adaptation plans. This will enable the consideration of climate change across the Territory, its assets, and its services in a consistent way.
- Review funding arrangements for recovery activities, enabling damaged assets to be rebuilt to a higher standard to improve their long term resilience, rather than like-for-like replacement as is common in disaster recovery assistance grants or insurance claims.
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- Develop an understanding of current community and private sector resilience to shocks and stresses (in addition to climate-related).
  Develop a monitoring and evaluation
- Develop a monitoring and evaluation system to enable the consistent and coherent implementation of adaptation actions. The system should document how these actions reduce climate risks and build community resilience. It would further enable reliable measurement of progress against stated goals.



- Set up a working group to manage data collection, data sharing, and risk modelling.
- Collaborate across ACT Government Directorates to use cross-organisation datasets to understand the interdependencies between services and operations (e.g. critical electricity supply needs).



- Integrate climate considerations into strategic land use and development planning.
- Review climate-related risks and opportunities associated with a transition to a low carbon economy to ensure the ACT is best placed to capture the benefits of this economic transition.



#### About AECOM

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