TOO HOT TO HANDLE

The scorching reality of Australia's climate–security failure

Safe Climate Australia

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Published May 2024 by Australian Security Leaders Climate Group, Canberra ACT.

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Photo: An Australian Army Chinook flight during the evacuation of local civilian residents as catastrophic bushfires burn Across East Gippsland (January 2, 2020).

Designed by: Studio for Good

INTRODUCTION

Climate risks remain missing in action

This is a report that the Australian Security Leaders Climate Group (ASLCG) wished it did not need to publish.

ASLCG was formed in 2021 by a group of senior former military and intelligence leaders concerned that the security implications of climate change were not understood or addressed by governments. The ASLCG focus is on human security in the broadest sense: the safety of people and communities and the systems they rely upon.

That concern is based upon the science developed over decades which demonstrates climate change is accelerating, is already dangerous, and has become an existential threat to human civilisation as we know it. Together with nuclear war, it is the greatest threat to humanity. Australia, as the hottest and driest continent on Earth, is particularly exposed to that threat.[1]

The first step in formulating security policy to address any threat is to soundly assess the risks and opportunities it presents, both current and as they are likely to evolve. This requires scientific and analytical expertise, and appropriate intelligence capacity to make such assessments.

The toxic nature of the climate wars in Australia over decades, and the priority given to preserving Australia's high-carbon fossil fuel industries, has meant that successive governments have never commissioned a comprehensive assessment of climate risk.

The fundamental duty of any government is "to protect the people" and thus fully assessing climate risk in order to avoid or mitigate it must be a priority. But leaders - in business, politics and public administration — have not acknowledged the full measure of the risk, so mitigation is inadequate.

ASLCG was encouraged that, after the 2022 election, the ALP acted on our suggestion that a national climate and security risk assessment should be carried out as a matter of urgency as the basis for formulating policy. Unfortunately, implementation of that commitment has faltered:

- The assessment of climate risks external to Australia, carried out by the Office of National Intelligence (ONI) and completed in November 2022, has been classified and hidden from politicians overseeing security and climate policy, and from the public;
- Climate was mentioned only in passing in the Defence Security Review;
- The climate analysis in the 2023 Intergenerational Report was only partial;
- A domestically-focused National Climate Risk Assessment is under way, but its approach to assessing risks is in our view seriously deficient.

The government also has in progress a National Adaptation Plan Issues Paper and a Climate Risk and Opportunity Management Program for the public sector 2024-26.

The fundamental failing running through this work is the refusal to accept the size and immediacy of climate risk in 2024, its compounding nature and its future implications, as the basis for mitigation and adaptation policy.

The present report provides an overview of an efficacious climate risk assessment methodology, analyses the current failure, explores four case studies and identifies specific and necessary priority actions for the government.

1 swissre.com/institute/research/topics-and-risk-dialogues/climate-and-natural-catastrophe-risk/changing-climates-heat-is-still-on.html

ABOUT ASLCG

The Australian Security Leaders Climate Group is a non-partisan network of Australian security and policy professionals. The ASLCG comprises former members of the ADF, the defence sector and Australian national security community, including many senior leaders. The ASLCG Executive members are:

Admiral Chris Barrie AC (Retd) former Chief of the Australian Defence Force. Chris Barrie retired in 2002 after 42 years in the Royal Australian Navy (RAN). Since then, he has worked on strategic leadership issues as consultant, teacher and mentor at Oxford University, the National Defense University in Washington DC and at the Australian National University.

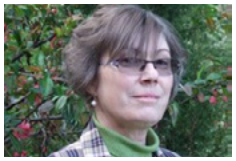
Air Vice-Marshal John Blackburn AO (Retd) former Deputy Chief of the Royal Australian Air Force and currently the Chair of the Institute for Integrated Economic Research – Australia, and also a consultant in the field of defence and national security. He has extensive experience across the fields of strategy, policy, planning, operational command, capability development and materials acquisition.

Colonel Neil Greet (Retd) a former Australian Army officer with operational service in Iraq and Timor Leste, who led projects in several remote indigenous communities and played a key role in Defence's response to Victoria's 2009 Black Saturday disaster. He is a Director of the Institute of Integrated Economics Research, and the consultancy Collaborative Outcomes.

Cheryl Durrant former Director of Preparedness & Mobilisation, Australian Department of Defence, and was the Defence partner with the Australian National Resilience Taskforce's Disaster Vulnerability Profiling Project. Cheryl served 15 years with the Australian Army, specialising in strategic intelligence, information operations and domestic security.

Major Michael Thomas (Retd) a former Australian Army officer and is a non-resident Senior Fellow with the Washington-based Center for Climate & Security where he co-leads the Indo-Pacific Program. He is also a council member with the International Military Council on Climate and Security and author of The Securitisation of Climate Change (2017).

Ian Dunlop a Member of the Club of Rome. He was formerly an international oil, gas and coal industry executive, chair of the Australian Coal Association, CEO of the Australian Institute of Company Directors, and chair of the federal government's first emissions trading taskforce, with wide experience in risk management.



Jane Holloway a systems scientist, recently retired from the Australian public service. Over several decades Jane provided research and analysis for various policy areas including Middle East relations, trade and environment, trade and development, agricultural and veterinary chemicals, biotechnology, assets and future of Australia's rangelands (Crown lands), futures analysis, emerging technology assessment, defence preparedness and global change effects.

THE "RISK OF RUIN" MATTERS MOST

To prevent global catastrophe, governments must first admit there is a problem

In risk management, there are potential events so destructive that they are termed catastrophic because of their capacity for human death or suffering on a massive scale, such that societies may never fully recover. This may also be called existential risk or in actuarial terms, the "risk of ruin", which colloquially in financial and gambling circles is the risk of "losing everything".

The risk of ruin is real. The eminent Australian scientist Prof. Will Steffen and his colleagues asked in 2022: "Could anthropogenic climate change result in worldwide societal collapse or even eventual human extinction? At present, this is a dangerously underexplored topic … yet there are ample reasons to suspect that climate change could result in a global catastrophe."[2]

Catastrophic events include nuclear war, climate change, biosecurity including pandemics, and disruptive technologies such as AI. The seventh annual report of Global Challenges Foundation on such risks added "ecological collapse" to the list,[3] whilst the World Economic Forum's 2024 *Global Risk Report* found that more than half of those surveyed believed that the risk of global catastrophe was high or extreme over the next decade, with climate-related risks again given top ranking.[4]

These are the greatest threats to our future, yet often governments are loath to even include them in their overall risk assessment processes because they are "too big", and because governments and people tend to focus on short-term opportunities rather than long-term risks. This is the "tragedy of the horizon"; the risk of leaving it too late to act with sufficient boldness on climate change.

Risks experts say that despite these warnings, if one were to ask government officials anywhere for their view of the risk of global catastrophe, "the response would be thunderous silence" because these worst-case scenarios are "out of the realms of imagination and the time frames of politics".[5]

Further, "to properly prevent and prepare for the risk, governments must admit there's a problem. Such an admission can only come with proper effort to assess and monitor global catastrophic risk, develop potential future scenarios, build and analyse intelligence, and invest in scientific and technical expertise."

Because markets, whilst valuable, are not capable of handling the ruin risk which their unfettered use has created, governments must act if our community is to survive and prosper. Governments must step in. They have the resources and mandate to act at the scale that global catastrophic risk demands.

It is something governments are uniquely suited to do because the risk of ruin is both a whole-of-government and a whole-of-society risk.

In 2022, the White House proposed a world-first *Global Catastrophic Risk Management Act* which would require a US government to conduct an assessment of existential and global catastrophic risk.6 Australia should emulate its security ally in this important and necessary task.

The Australian nation is endowed with a strong scientific research community and the resources to invest in such a project.

2 pnas.org/doi/10.1073/pnas.2108146119
3 globalchallenges.org/app/uploads/2023/12/GCF-Annual-Report-2023-through-collective-action.pdf
4 weforum.org/publications/global-risks-report-2024/in-full
5 thebulletin.org/2024/03/to-prevent-global-catastrophe-governments-must-first-admit-theres-a-problem

KEY FINDINGS AND RECOMMENDATIONS

Key findings

- **Climate disruption** now presents the greatest, and potentially existential, threat to society and human security in Australia and around the world. A new insecurity shadows our lives and the relations between nations. The Asia-Pacific, the highest-risk region in the world, faces devastating climate impacts, and Australia as a hot and dry continent is particularly vulnerable.
- **Responding adequately** to climate disruption is fundamental to the survival of the nation and the global community. In understanding climate-security threats, the first and fundamental step is to holistically assess systemic climate risks and how they cascade and compound through physical and human systems. This has not been done by Australia.
- **Lack of assessment** by a succession of Australian governments has left our nation with a poor understanding of the looming climate risks, so it is not prepared to face global warming's consequences and mitigate the risks.
- **Australia remains "missing in action"** on climate-security risks, with climate downplayed to a cameo role in defence and security policy and planning.

Key recommendations for the Australian government to build an integrated National Climate-Security Strategy

- **Establish** a Climate Threat Intelligence branch within the Office of National Intelligence with outputs including an annual, de-classified briefing to Parliament.
- **Establish** an Abrupt Climate Change Early Warning System.
- **Legislate** a Global Catastrophic Risk Management Act.
- **Publish** a declassified version of the 2022 ONI assessment of climate and security risks.
- **Plan and integrate** climate research in Australia in a manner that will deliver a sound platform for realistic risk assessment and government policy-making.
- **Rebuild** the climate policy-making capacity of the Australian Public Service and overcome the bureaucratic silos that are making systemic analysis of climate risks difficult to achieve.

Australian Defence Force Personnel Assist With Fiji Disaster Relief Efforts In Wake Of Tropical Cyclone Yasa (Photo: Getty Images)

HOW TO UNDERSTAND CLIMATE RISK

Big-picture thinking about risk is crucial to averting security failures

Realistic climate policy can only be developed when the problem it is designed to address and its risks are understood to the greatest extent possible.

The nature of the risks

- Climate risks are **existential** in threatening the basis of our society and economy and the sovereign existence of communities and states alike, posing large, irreversible harm if not rapidly addressed.
- In the mapping of potential threats, **the greatest risk lies at the high-end** (or "fat tail") of the range of outcomes, which should be given particular attention. A fat-tail risk is the probability of events with higher impacts occurring than might be expected under a normal probability distribution. Focusing on the most likely outcomes creates a false sense of security.
- In the physical climate, many systems exhibit **fast, non-linear change** which is difficult to model or project, and which is often associated with a tipping point.
- Many climate systems exhibit **tipping points or thresholds** at which a small change causes a larger, more critical change to be initiated**,** taking that system from one state to a discretely different state far less conducive to human survival and prosperity. The change may be abrupt and irreversible on relevant time frames, possibly leading to cascading events.
- An **unforeseen chain or cascade of events** may occur when one event in a system has a negative effect on other related components. For example, the mutual interaction of individual climate tipping points and/or abrupt, non-linear changes, may lead to more profound changes to the system as a whole.
- Systemic climate risks are multiplying and intensifying, interconnected and cascading across natural and human systems, and require **a systems approach to understand them**.

Assessing the risks

- A full climate change risk assessment should be carried out in line with **risk management best practices**, taking into account the **full range of outcomes**, including tipping points and **the risk of ruin**. This must not be based only on historic experience, which may well be irrelevant to the future state, and must incorporate methods to understand unprecedented climate impacts.
- Hence a fundamental rule of risk assessment is to **focus on the "fat-tail" risks and the plausible worst case scenarios**, especially when the damages are so great and the risks are existential, such that there is no "second chance" to learn from one's mistakes.
- Benchmarks established for assessing risks and solution efficacy should have **a low probability of failure**. Policies requiring low risks of failure applied to the banking and insurance sector, and in safety management, should also be applied to the far greater risks from climate change.
- These requirements and the systemic nature of the risks means governments must **fundamentally rethink the approach to climate risk assessment** and response, embracing complex risk analysis. Physical and economic climate models have fundamental limitations so expert elicitation and scenario planning are crucial components in risk analysis.
- **A systems approach requires an integrated method of analysis** of the complex relationships within and between human and physical climate systems in creating cascading and compounding risks — one that avoids silos, cherry-picking potential risks and partial "bottom up" approaches.
- **The urgency of required action should explicitly be considered** and articulated, with policy and project systems structured to respond at the speed required.
- **The lack of certainty in risk assessment should not be taken as an excuse for inaction** if risks are potentially catastrophic or existential in nature. Precautionary action may be essential.

TOO HOT TO HANDLE?

Climate is not yet a key part of the government's risk and security agenda

How can the Australian government's performance on climate-security risks be judged? One approach would be to focus on policies and statements of substance on the issue by relevant ministers, including the prime minister, beyond the token declarations of concern when Pacific Island leaders are within earshot, or a flood or fire is raging (see case study on page 24).

Another approach is to examine key government reports and documents which would be expected to properly encompass climate-security risks, as follows.

Risk assessment by the Office of National Intelligence

The ALP government is to be commended for commissioning a climate-security risk assessment, authored by the Office of National Intelligence (ONI). In doing so, it did what every previous government had failed to do, and which the Liberal and National Parties still refuse to acknowledge as a necessary task.

Unfortunately, ONI's report has been securitised, with no declassified version released, unlike the practice of our major allies, or the practice with the Defence Security Review. This has severely reduced the report's usefulness and denied parliamentarians the knowledge they need to carry out their responsibilities in this policy area.

The silencing of the report is discussed in more detail in the case study on page 12.

The National Climate Risk Assessment

The National Climate Risk Assessment (NCRA), initiated by the government in early 2023 and managed by the Department of Climate Change, Energy, Environment and Water, is a two-step process focused on domestic climate risks:

- **Stage one:** Consultation with stakeholders to qualitatively identify a list of nationally significant climate risks, with a subset of these deemed priority risks, with a report issued in March 2024; and
- **Stage two:** An in-depth qualitative and quantitative assessment of the priority risks, to be completed by the end of 2024, which is currently underway.

ASLCG, whilst appreciating being a stakeholder in the NCRA process, has expressed major reservations to the NCRA team about the methodology being used:

- There is the danger of dividing a risk assessment into "global" and "domestic" silos. The NCRA team has not been privy to the ONI work. The separation of the NCRA domestic assessment from the ONI external assessment will likely fail to identify vital systemic risks;
- Stage one was based upon participants' historic experience, and there was no effort to project the future evolution of climate risk, for example by using scenario methods;
- The NCRA uses a "bottom-up" process that separately identifies the list of nationally significant risks, rather than starting with the holistic system risks and then devolving down to their many cascading and inter-related impacts. The NCRA list, whilst comprehensive, is general and gives no sense of urgency or ranking which would have been provided by the global top-down perspective developed by ONI; and
- The NCRA stage one report mentions that decision-makers should be considering "the most severe possible outcomes - plausible worst case scenarios", but there is no indication this is actually being done. It confirms it is using a 1.5-2°C scenario for 2050, which in the view of ASLCG is out of date given the recent acceleration in the rate of warming.

IF WE CARRY ON THE WAY WE ARE GOING NOW, I CAN'T SEE THIS CIVILIZATION LASTING TO THE END OF THIS CENTURY.

Professor Tim Lenton, University of Exeter[6]

6 twitter.com/ThierryAaron/status/1455289449659633692

Agencies — such as the Climate Change Authority, CSIRO, Bureau of Meteorology and the Australian Climate Service — and the NCRA predominantly use Intergovernmental Panel on Climate Change projections of future warming and impacts as the bedrock of their work on future climate evolution. These have been shown to be too conservative. If this continues, it will become a significant problem as NCRA advice on future impacts will be out of date and underestimate the threats and their timelines.

The stage one report dispenses with the conventional colour classification of red/orange/yellow/green in presenting risk rankings, preferring calming greens and black, complemented by climate-impact-free tourist photos of Australia.

There is little sense of urgency in this assessment work, which will take the first two-and-a-half years of the government's three-year term. The approach is in stark contrast to the EU Environment Agency's first climate risk assessment released in March 2024[7] which, along with the 2021 Chatham House assessment, is quite explicit on the escalating climate risks and the need for accelerated action.[8]

Of great concern is the decision to exclude from the NCRA any consideration of climate mitigation to reduce climate risk; the focus is purely on adaptation, even though some risks being considered by the NCRA are beyond adaptation and further mitigation is fundamental to their amelioration. The assumption in the NCRA work is that the government's current mitigation policies are adequate, even though the government is at the same time overseeing the expansion of the gas export industry and approving new coal mines.

National Adaptation Plan

The government is developing a National Adaptation Plan which will establish a comprehensive framework for adaptation measures for the 11 priority risks identified and analysed by the NCRA.

A March 2024 issues paper emphasises that "successful local adaptation relies upon the provision of high-quality information on climate risks and climate risk planning tailored to its users, provided as part of an effective framework of local, state and national adaptation policies".[9]

If high-quality information is a key component of the plan, then it is essential the concerns raised about the NCRA be addressed, particularly regarding the need for an integrated assessment of global and domestic risks, and of climate mitigation and adaptation.

Defence Strategic Review

The 2022 Defence Strategic Review (DSR) was "to be informed by intelligence and strategic assessments of the most concerning threats which challenge Australia's security".[10]

ASLCG submitted to the DSR that global inaction has resulted in climate change "becoming an immediate existential threat to humanity", and together with nuclear war is "the greatest threat challenging Australia's security". It should be the primary focus of the DSR requiring "a fundamental reframing of Australia's defence and security strategy, away from traditional nation state geopolitics, to focus on unprecedented global co-operation rather than conflict, particularly with China".[11]

7 eea.europa.eu/publications/european-climate-risk-assessment
8 chathamhouse.org/2021/09/climate-change-risk-assessment-2021/summary
9 dcceew.gov.au/climate-change/policy/adaptation
10 defence.gov.au/about/reviews-inquiries/defence-strategic-review
11 aslcg.org/wp-content/uploads/2022/12/ASLCG_DefenceStrategicReview.pdf

ASLCG called for "an emergency response, akin to wartime mobilisation", recognising that "strategic and economic choices, between conflict or cooperation around climate risks, will have to be made by all nations" and that whilst Australia "needs an effective defence capacity to protect its own territory and to respond to regional disruption… far more investment will be required to address climate change than currently anticipated, which may well require funds to be reallocated from defence".

The declassified version of the DSR report was publicly released on 24 April 2023, in sharp contrast to the secrecy surrounding the ONI climate risk assessment. It focused narrowly on hardware acquisition priorities, at the expense of considering the full range of global, regional and human security risks. Learnings from the ONI report were sidelined and climate was not integrated into the DSR. In fact, climate-related security discussion rated a token half page in a document of 110 pages.

Whilst Pacific governments, the UN Secretary General and the US Defence Secretary all agree that climate breakdown is an existential risk, the DSR chose to all but ignore it. When think-tanks of Australia's allies were warning that cascading climate impacts will drive regional and international conflict, Australian plans to prepare for and mitigate this security risk were noticeably missing in action.

National Defence Strategy

An 80-page declassified version of the National Defence Strategy (NDS) was released in April 2024 with precisely two sentences of substance on climate's impact in "amplifying existing stressors across the region, such as poverty, food security and cross-border migration and displacement. These effects may also intensify transboundary tensions and have impacts on Australia's national security." But exactly how that will affect Australia and how Australia will practically respond to those effects is not analysed.

Whilst the NDS focus on military hardware and war-fighting capability is understandable given the escalation in conflict globally, the NDS fails to recognise that the rapid acceleration of climate impacts through 2023 confirms that climate is a far greater threat for all nations, requiring a fundamental recalibration of security and defence thinking.

The emphasis on bolstering Australia's northern bases — with $14-18 billion from 2025-34 additional to $3.8 billion already committed — sidesteps the fact that climate impacts will become far worse than anything so far experienced by even hardened military professionals, likely rendering those bases inoperable for long periods (see case study page 14).

Clearly the forthright messages likely contained in the ONI report are still being downplayed, risking a massive misallocation of resources, and failure to prepare for the greatest threat to national and human security.

Intergenerational report

The US inquiry into the 9/11 World Trade Centre attack in New York concluded that the greatest government shortcoming was the intelligence agencies' failure to "connect the dots".

The Australian Government's *Intergenerational Report* (IGR) released on 24 August 2023 claimed to canvas the big impacts on the Australian economy and budget over the next 40 years.[12] But in focusing on economic detail, the report missed the systemic global climate risks that will upend the economy, and failed to connect the most critical climate dots.

This is a classic example of the thinking in silos identified in the 2016 UK report *Thinking the Unthinkable* as one factor that has led to "a new fragility at the highest levels of corporate and public service leaderships", in that their ability to spot, identify and handle unexpected, non-normative events has become "perilously inadequate at critical moments".[13]

12 treasury.gov.au/publication/2023-intergenerational-report
13 procurious.com/blog-content/2016/04/Thinking-The-Unthinkable-Report.pdf

The IGR admits that climate warming will have "profound impacts" with "some costs… unavoidable", but it also presents "new opportunities and economic challenges" with Australia "well positioned with renewable energy potential and abundant natural resources" to "take advantage of the opportunities emerging from the global net zero transformation".

The IGR had one big number, typically headlined by the media as "Global warming to cost Australia up to $423 billion over 40 years", but over 40 years that is only 0.5 per cent of current GDP each year on average, and that figure was just a rough estimate of the impact of decreases in labour productivity levels caused by climate disruption. Other key impacts identified were a one-to-three per cent decline in crop yields, a 6-25 per cent drop in tourist arrivals, and the increasing cost of more extreme climate impacts, including a cumulative $130 billion of Government spending on Disaster Recovery Funding Arrangements. And that was about it.

A footnote acknowledged that only "selected impacts" had been examined in "a partial assessment of the physical impact", excluding "health impacts, biodiversity loss, storm surge and sea level rise, amongst many others".

Nowhere in the report was there any recognition that projected climate disruption in our region will have an enormous impact on Australia and how Australians live their lives. Many millions of people will be forcibly displaced by climate impacts; states will fail and civil war within and between states, including some of our regional security allies, is likely.

Australia's Climate-Security Report Card

Assessment of the government's performance relating to climate-security risk 2022-2024.

ACTIVITY	DESCRIPTION	RATING
Office of National Intelligence climate-security risk report (2022)	The ONI report is classified as secret, which severely diminishes its usefulness. No rating possible without access to key findings.	
National Climate Risk Assessment (ongoing)	The methodology for this report (still in progress) appears very deficient, leading to significant doubt as to whether it will deliver a comprehensive and integrated assessment.	★★☆☆☆
National Adaptation Plan issues paper (2024)	Too early to assess. No rating possible.	
Defence Strategic Review (2023)	Tokenistic effort on climate risks which are not incorporated into broader analysis.	★½☆☆☆
National Defence Strategy (2024)	Two sentences of substance about climate in the 80-page strategy. No comprehension of the scale of the threat, or responses.	★½☆☆☆
Intergenerational Report (2023)	Climate analysis is partial and the report does not give a full picture of likely impacts on future generations.	★★☆☆☆
Understanding existential climate risks	There is little visible sign that government departments or ministers have a grasp of the "risk of ruin" approach to climate assessment.	★½☆☆☆
Public communications of climate-security risks	No evidence that public engagement is a priority for the government.	★☆☆☆☆

BEWARE THE STING IN THE TAIL

How should Australia assess climate risks? "We need to have a best guess about the worst-case and make policy on that basis", writes the UK Institute and Faculty of Actuaries, in a new report with the University of Exeter, *Climate Scorpion – The sting is in the tail: Introducing planetary solvency*.[14] Knowledge gained from the actuarial profession in assessing risk across the financial sector is applied to climate risk analysis.

The "sting in the scorpion tail" refers to the risk of unlikely events occurring in the high-end "tail" of the probability distribution. Such events may be rare but can have significant impacts on financial markets, investments or other systems: "Actuaries often pay attention to tail risk as it involves the potential for large losses, which are of particular interest for risk management."

The Australian Government should learn from the *Climate Scorpion* approach, which encompasses:

Realistic worst-case scenarios: "A full risk assessment of climate change should be carried out in line with risk management best practices. This should take into account the full range of outcomes, including tipping points, realistic worst-case scenarios and the risk of ruin. This should be informed by a global warming 'experience analysis', up-to-date information on global warming, greenhouse gas levels, aerosol cooling and other material factors that may influence temperatures."

A systems approach: "Climate change has arrived, with severe impacts emerging at lower temperatures than expected. The distribution has shifted; historic tail risks are now expected. Climate risks are complex, interconnected and could threaten the basis of our society and economy. A systems approach is required."

Low probability of failure: "An insurance company needs to be able to withstand the uncertainty of severe events. Under the European Solvency regime, the probability of failure is set at 0.5 per cent or, put another way, insurance companies are required to hold enough capital to survive an unlikely but possible 1-in-200 year set of adverse events. Society as a whole might reasonably expect a similar standard for climate change and other risks that are faced."

Triggering tipping points: "Warming above 1.5°C is dangerous, increasing the risk of triggering multiple climate tipping points. Tipping points include the collapse of ice sheets in Greenland, West Antarctica and the Himalayas, permafrost melt, Amazon die-back and the halting of major ocean current circulation. Passing these thresholds may constitute an ecological point of no return, after which it may be practically impossible to return the climate to pre-industrial (Holocene) stability. Tipping points may interact to form tipping cascades that act to further accelerate the rate of warming and climate impacts."

14 actuaries.org.uk/media/g1qevrfa/climate-scorpion.pdf

CASE STUDY 1

DEAD AND BURIED?

Following advocacy by the ASLCG to all political parties prior to the 2022 federal election, the ALP government shortly after coming to power commissioned the ONI to carry out a climate-security risk assessment focussed on regional issues but not domestic risks, with a short timeline so it could be fed into the DSR.

The 2021 ASLCG *Missing in Action* report advocated that the government:

- Appoint an independent, expert panel to urgently conduct a comprehensive climate and security risk assessment, using the best available information;
- Establish an Office of Climate Threat Intelligence; and
- Assess the threats and impacts of climate disruption with brutal honesty, identifying the worst, as well as most likely, cases and considering the full range of probabilities.[15]

It also urged the government to "take a holistic view and integrate responses — whether that be across government departments, or across national and regional boundaries — recognising that complexity cannot be treated in separate 'silos'".

Clearly the government ignored this recommendations about silos. The ONI report focussed only on international issues, while the subsequent NCRA had a domestic focus (see page 6).

The ONI report was not made available for the NCRA, creating precisely the cleavage in analysis the ASLCG had warned about. But the problem is much deeper, because the ONI report has been classified and apparently made available to none bar the members of the National Security Committee of Cabinet, close staff and relevant departmental heads.

The report's key risk conclusions have been buried, such that members of parliament including those who oversee relevant committees have not seen the ONI report. It is inconceivable that MPs and Senators could do their job of formulating and reviewing policy and performance on this greatest-of-all threats when the National Security Committee of Cabinet will not share with them intelligence analysis on the form and severity of that risk. They have been left in the dark, as has almost the entire public service and the Australian people.

Our close allies do make available declassified versions of similar assessments, and there is no reason for the Albanese government not to do the same. It may be the case that the picture painted by the ONI report did not suit the government's preferred climate narrative, which emphasises energy and jobs, ignoring risk (see case study on page 24).

The government's security narrative is that China is the greatest threat to Australia's future. Hence AUKUS, the Quad, the continual regional hand-shaking, more joint military exercises, the illusion of nuclear-powered submarines and an enhanced US presence in Australia's north. But this narrative does not align with international thinking.

15 aslcg.org/wp-content/uploads/2021/09/ASLCG_MIA_Report.pdf

The World Economic Forum's 2023 survey of public and private sector global leaders found that the biggest three risks in the coming decade were all climate-related, whilst "geo-economic confrontation" (read China) came in ninth.[16]

The ONI report was unlike previous climate impact advice received by any Australian government. It is likely that it drew some of its methodology and data from the Chatham House *Climate Risk Assessment 2021*, which warned that by 2050 global food demand will be 50 per cent higher than 2020, while crop yields may be 30 per cent lower. That report concluded that cascading climate impacts will "drive political instability and greater national insecurity, and fuel regional and international conflict".[17]

US intelligence agency reports identify South and Central Asia, the Pacific small island states and Indonesia as "highly vulnerable countries" of concern for climate disruption.[18] South Asia, China and Indonesia are identified by the World Resources Institute as countries where water stress will be "extremely high" by 2040.[19]

Retired Admiral Chris Barrie, former Chief of the Australian Defence Force, has said repeatedly that brutal climate impacts will produce state instability and failure in both Asia and the Pacific, including in some of the most populous nations. This is especially true of those with semi-democratic governments and existing insurgencies, either domestically or in neighbouring states.

There will likely be a further retreat to authoritarian and hyper-nationalist politics, the diminution of instruments of regional cooperation, and increased risks of regional conflict, including over shared water resources from the Himalayas and the Tibetan Plateau. This would encompass India, Pakistan, China and southeast Asian nations.

Not only does the parliament not know what ONI said, but the government has made no statement about the report, or in fact said anything substantial about climate-security risk. It has made no effort to help build public understanding about the profound risks, but the opposite. That knowledge is under lock and key.

Concealing the ONI analysis is the opposite of good security policy governance. It means we face a threat that we cannot even talk about.

16 weforum.org/publications/global-risks-report-2023/
17 chathamhouse.org/2021/09/climate-change-risk-assessment-2021
18 dni.gov/files/ODNI/documents/assessments/NIE_Climate_Change_and_National_Security.pdf
19 wri.org/insights/ranking-worlds-most-water-stressed-countries-2040

CASE STUDY 2

NORTHERN EXPOSURE

The Australian Government is giving priority to the development of northern Australia, including fossil fuel energy resources, regional trade expansion, indigenous affairs and increased military presence in line with DSR strategic realignment.

But has the government fully considered the impacts of climate change on the future viability and liveability of that region? This question should be answered as a matter of urgency before irrevocable commitments are made and substantial resources misallocated.

Unprecedented heat

Two important research papers describe those parts of the world that will exhibit levels of heat beyond that ever experienced in human history. These regions are defined as those with a mean annual temperature of greater than 29°C (MAT >29°C), where MAT is the average of daily minimum and maximum over a year.

MAT >29°C is described by researchers in the 2020 "Future of the Human Niche" paper as resulting in "near-unliveable conditions", currently found on only 0.8 per cent of the planet's surface, mostly in the Sahara.[20]

Both papers describe an area of northern Australia with MAT >29°C at around 3°C of global average warming. This could occur as soon as 40 years hence, if the current trend of accelerated warming is maintained, in the period 2060-2070.

The 2023 "Quantifying the human cost of global warming" paper maps those regions subject to unprecedented heat at 2.7°C global average warming.[21] This heat zone includes a significant portion of Australia's north, as illustrated by the shaded area in Figure 1.

Near-unliveable conditions in northern Australia

How extreme will the heat be in Australia's north when average global warning has reached 2.7°C, as illustrated in Figure 1?

Drawing on CSIRO modelling also made available for the Climate Council's HeatMap tool,[22] Table 1 gives a range for days per year over 35°C and over 40°C, with the lower end of the range being RCP8.5 at 2050 (approx. 2°C of global warming) and the upper end of the range being RCP8.5 at 2090 (approx. 4°C of global warming). Also included are nights above 25°C, because persistent hot nights reduce the human body's capacity to recover from days of extreme heat.

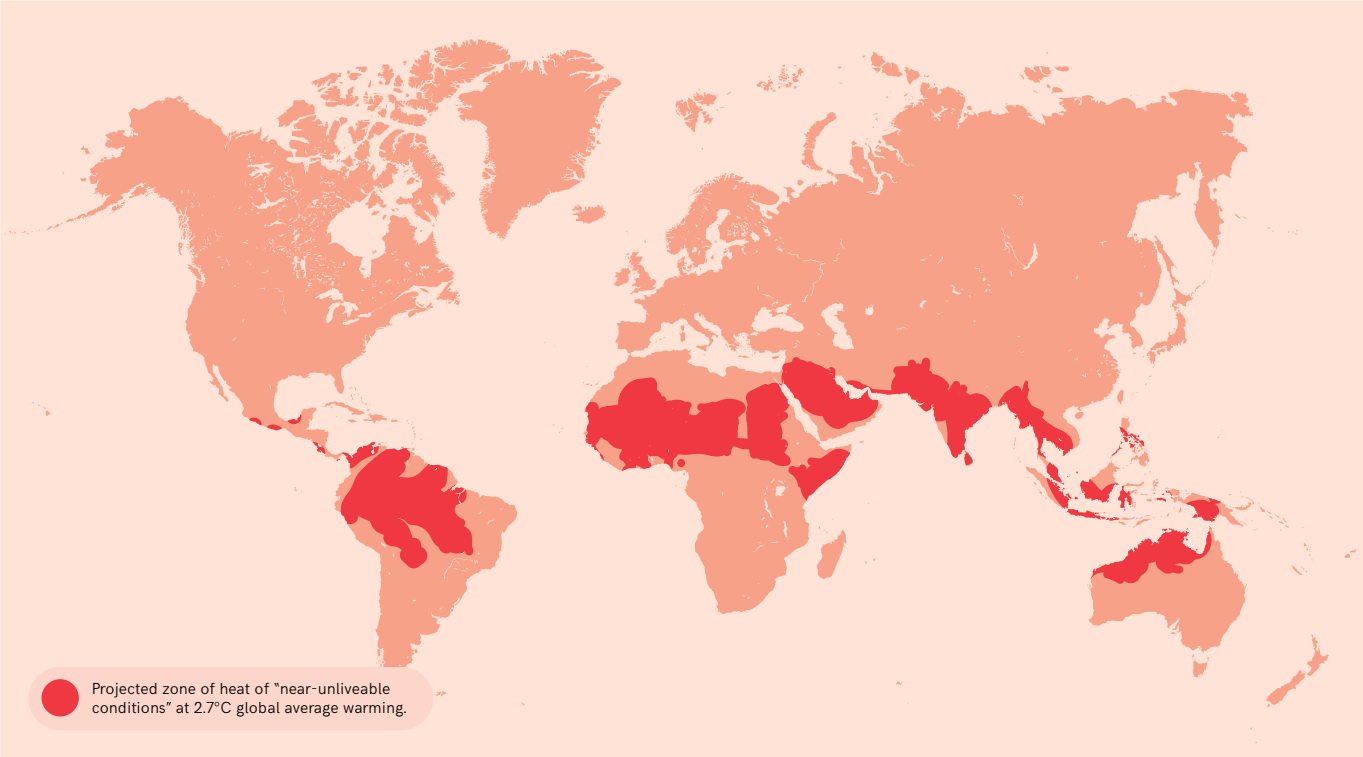
Table 1: Projected extreme heat days at 2-4°C of global average warming for selected northern Australia locations

	Days over 35°C	Days over 40°C	Nights above 25°C
Darwin	166 - 283	0 - 4	212 - 278
Katherine	239 - 297	42 - 100	157 - 215
Derby	250 - 307	57 - 121	177 - 228
Bradshaw	228 - 289	33 - 92	150 - 213

These figures are conservative projections, in that the HeatMap tool uses average, rather than the worst-case changes in temperature extremes; and because observed changes in temperature extremes in most parts of Australia during 2011-2020 tracked much higher than the projected changes for that period, and already are often tracking at the changes projected for the 2030 (2021-2040) period.

20 pnas.org/content/early/2020/04/28/1910114117
21 nature.com/articles/s41893-023-01132-6
22 climatecouncil.org.au/resources/heatmap/

Figure 1: Projected zone of heat of "near-unliveable conditions" at 2.7°C global average warming.



Source: "Quantifying the human cost of global warming"[23]

Impacts above 35°C

Conditions above 35°C create discomfort and a range of health impacts, from mild to severe, and can ultimately be fatal without intervention.[24] Many regulators and researchers use 35°C as an important threshold for safety, work and climatic conditions. Working on Victorian building sites, and elsewhere, ceases above 35°C as a health and safety issue.

Heat affects our ability to think and reason,[25] and can have significant effects on mental health and behaviour, including increased levels of violence and suicide.[26]

Researchers denote 35°C as the point where substantial productivity is lost. The International Labour Organisation reports that: "Excessive heat during work creates occupational health risks; it restricts a worker's physical functions and capabilities, work capacity and productivity. Temperatures above 24-26°C are associated with reduced labour productivity. At 33-34°C, a worker operating at moderate work intensity loses 50 per cent of his or her work capacity."[27]

23 nature.com/articles/s41893-023-01132-6
24 academic.oup.com/heapro/article/30/2/239/56186
25 psychologytoday.com/au/blog/evidence-based-living/202308/how-heat-waves-affect-your-ability-to-think-and-reason
26 psychiatrictimes.com/view/impacts-extreme-heat-mental-health
27 ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_711919.pdf

Wet bulb temperature

Wet bulb temperature (WBT) is a measure of heat stress conditions including both temperature and humidity, because the body finds it more difficult to cool down with higher levels of humidity. At some level of heat and humidity, the human body can no longer cool itself and its internal temperature rises uncontrollably. In a 2023 study, Pennsylvania State University researchers found that threshold to be a WBT of 31°C for a sample of young and healthy research subjects who were not accustomed to such humid conditions.[28]

When will the climate in Australia's north reach this critical WBT boundary of 31°C? Humidity in the Northern Territory during the summer wet season can reach higher than 80 per cent[29] and afternoon relative humidity averages over 70 per cent during the wettest months. WBTs are calculated as a function of temperature and humidity; for example a temperature reading of 40°C and 70 per cent humidity is a WBT of 34.9°C.

In Darwin, the WBT already exceeds 31°C on a summer afternoon scenario at 3pm with low wind speed, with a WBT of 33.4°C, which would increase to around 35°C in the future conditions described above.[30] New research paints a broader picture of such extreme heat stress across northern Australia in such a scenario, with some areas experiencing a WBT above 30°C for up to 50 days a year, illustrated in Figure 2.[31]

Impacts on northern Australian development

The impacts of climate change on northern Australia's citizen population and economic activity will be multi-faceted and far-reaching.

Capacity to withstand extreme heat is a function of adaptation measures and work practices. Some heat stress risk can be mitigated by taking a systemic approach that would look not only at the physical climate conditions and the specific activity, but also the person conducting the activity, for example what other exertions they had undertaken prior to the specific activity.[32] This would provide some strategies to reduce heat stress risk in the short term, but the main issues remain. Labouring in a field in the blazing sun is very different from working in an air-conditioned office.

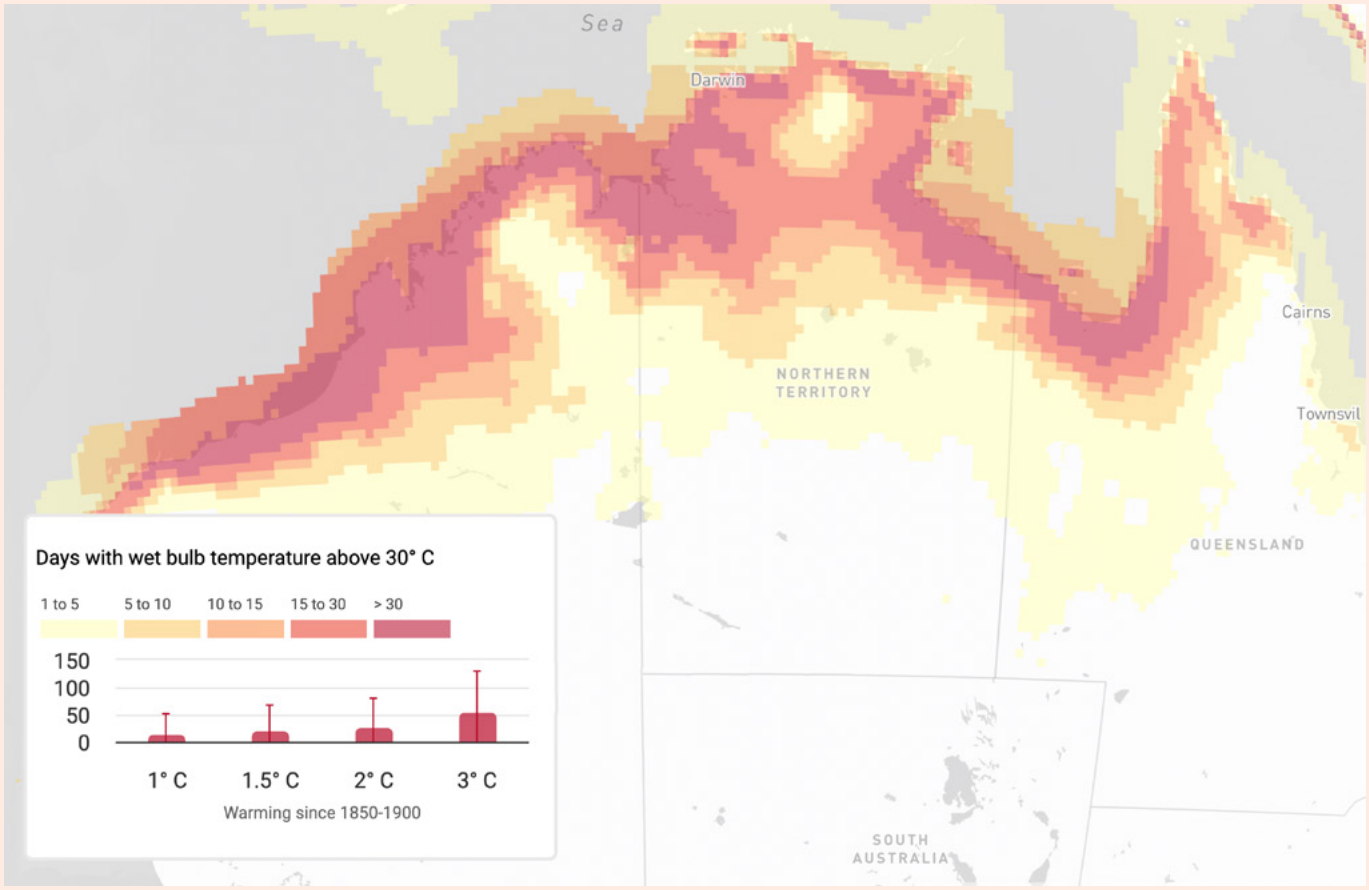
But it is not just the direct effect of extreme daytime heat on people. It also affects materials, buildings and equipment, electronics and communications, tropical disease vectors, civil infrastructure such as roads, and so on. A hotter climate will bring sea-level rises and more intense flooding and cyclones and the physical disruption they cause. The risks aggregate.

Once northern Australia reaches a state of "near unlivable conditions", the area will be likely to partially depopulate and the services and infrastructure on which civil society and the military depend — transport and logistics, utilities, health and social and education services for families — will degrade.

Business and economy: Economically, climate change poses severe risks for northern Australia, including the cattle industry and tourism, and increased property and infrastructure loss and damage. The mining industry will grapple with the unpredictability of the new climate regime, and face operational disruptions and likely lower productivity.

28 journals.physiology.org/doi/full/10.1152/japplphysiol.00738.2021
29 northernterritory.com/plan/weather-and-seasons
30 sciencedirect.com/science/article/pii/S2212094722000123
31 pnas.org/post/update/climate-change-interactive-maps-offer-telltale-glimpse
32 link.springer.com/chapter/10.1007/978-3-319-73408-8_14

Figure 2: Days per year with wet bulb temperatures over 30°C at 3°C of global warming.



Credit: Peter Aldhous, based on data from Probable Futures[33]

The government is strongly encouraging the expansion of the gas industry in the north, supporting projects such as Woodside's Scarborough, Santos's Barrosa, Beetaloo Basin fracking and Darwin's Middle Arm Precinct. None of these should be proceeding if the government was seriously addressing climate risk, as the corresponding emissions increase will only hasten the transition of the region to unlivable conditions. Can the gas giants still operate in the adverse conditions they are helping to create? The oil and gas industry is accustomed to operating in extreme conditions, but the world ahead is of an entirely different nature from anything the industry has experienced historically.

Indigenous communities: Vulnerability is inversely proportional to community income and having the resources and support necessary for adaptive behaviours. Increasing heat and other climate extremes will have profound effects on the indigenous population in the north and strain conventional civil services such as health and emergency response capability, and housing, as well as disrupting traditional connections to land and sea. One survey of potential climate change adaptation strategies among Aboriginal people in coastal communities in northern Australia found that over half of respondents in Arnhem Land would consider relocating in the future for safety reasons, either permanently or temporarily.[34]

33 pnas.org/post/update/climate-change-interactive-maps-offer-telltale-glimpse
34 link.springer.com/article/10.1007/s11069-013-0591-4

Defence implications: Can military bases operate effectively in these conditions?

The DSR proposed that: "Upgrades and development of our northern network of bases, ports and barracks should commence immediately", and that "options should be developed to leverage the capabilities offered by local and state governments as well as civil minerals and petroleum resources industry infrastructure in northern and central Australia". These bases are illustrated in Figure 3, together with the zone of projected extreme heat.

In response, Defence Minister Marles announced that the government would bolster investment in Australia's northern bases, committing $3.8 billion over the next four years, saying that "this is an important opportunity which will ensure the ADF has the infrastructure and capabilities it needs into the future".[35]

But which future? That will be a hotter future, yet in 110 pages the DSR devoted just three cursory paragraphs to climate change. There was not a word about how a hotter climate would affect the viability of defence assets in the north of Australia, the liveability for service personnel and their families, what special measures would be required, nor whether bases should be (re)located to less-climate-extreme parts of the north.

Heat-related illness is increasing among US military personnel.[36] Extreme heat puts military personnel at greater risk of heatstroke and causes significant delays in training. According to DoD statistics, rates of heat stroke among military personnel in the US nearly doubled between 2014 and 2018.[37] And already, Australia's monsoon tropics seasonally experience conditions beyond extreme heat thresholds.[38]

In a 2015 study on the severity of heat strain experienced by a sample of 64 soldiers during training in tropical northern Australia (Townsville), high strain was evident from high heart rate, gastrointestinal temperatures, perceived body temperature and other measures in conditions with a WBT of 27-28°C, far lower than will be regularly experienced in the future at the northern training bases.[39]

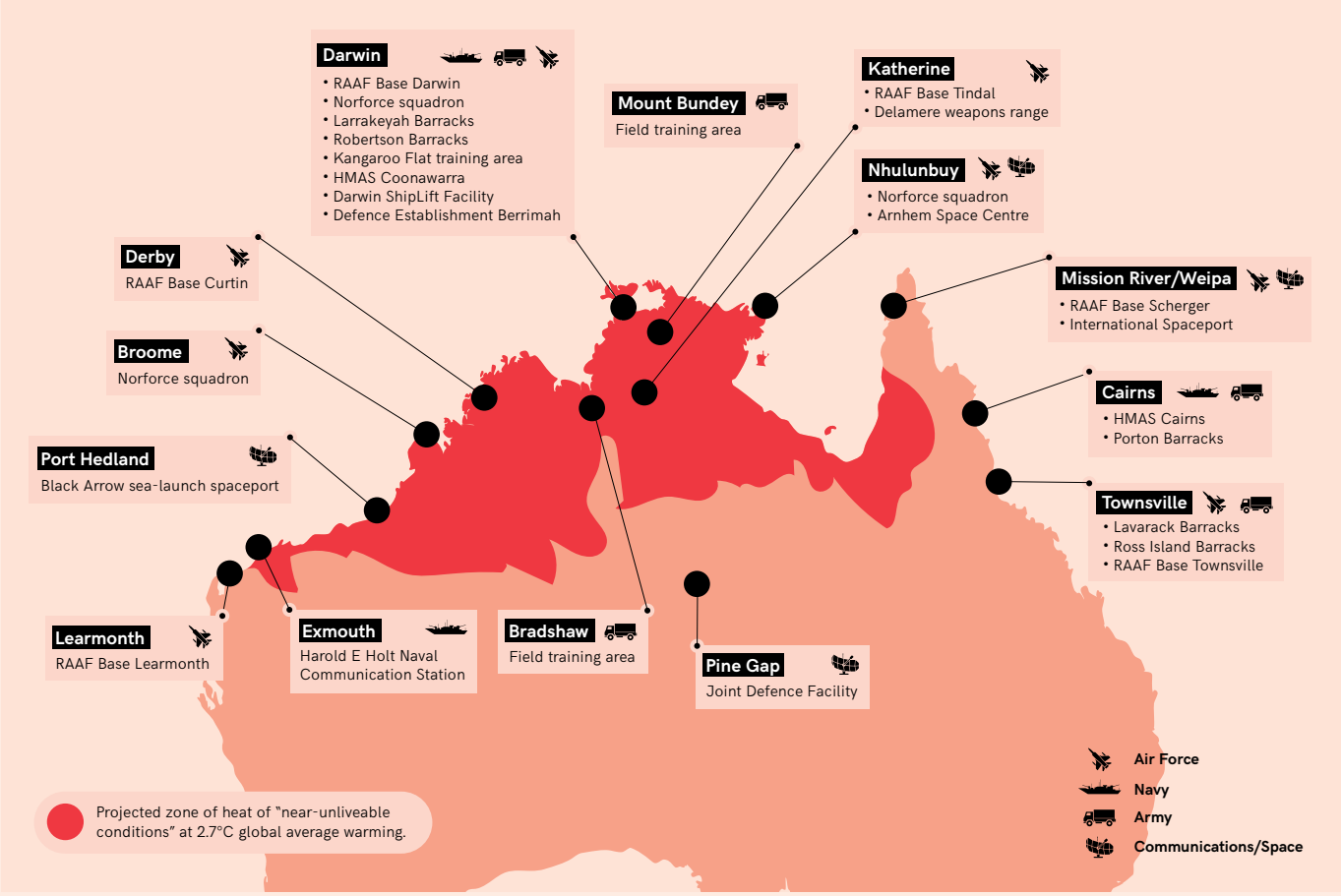
The four locations selected in Table 1 above — Darwin, Katherine, Derby and Bradshaw — include the main Air Force and Navy facilities, an Army field training area, the Delamere weapons range, and the most significant Army barracks in the area. In these locations, days are warmer than 35°C for the majority of the year, and warming exceeds 40°C for the equivalent of one to four months of the year for three of the four locations. All locations will experience nights above 25°C for half the year, or more.

One primary function of several of these bases is Army field training. Heat stress is dependent on how work is organised. Already training and operations are being cancelled due to extreme heat. Methods can be adapted to suit conditions: for example, night training (which requires infrastructure and safety systems which appear not to be in place), ice vests, underground bunkers, special protective equipment, adjusting the ratios of work to rest, and so on.

But putting in more air conditioning and trying to make cool islands will only get us so far. Some activities, including military operations, preparation, training and equipment/base maintenance and repairs, may not be possible in future during the daytime either at all or without protective equipment.

35 minister.defence.gov.au/media-releases/2023-04-27/strengthening-australias-northern-bases
36 climateandsecurity.org/2019/08/heat-related-illness-increasing-among-u-s-military-personnel/
37 jstor.org/stable/resrep30914
38 journals.ametsoc.org/view/journals/wcas/10/4/wcas-d-17-0084_1.xml
39 researchgate.net/publication/27254578_Soldier_performance_and_heat_strain_during_evaluation_of_a_combat_fitness_assessment_in_Northern_Australia

Figure 3: Zone of extreme heat and defence bases in northern Australia at 2.7°C global average warming.



Global Temperature Data Source: "Quantifying the human cost of global warming"[40]

The issue is not simply operability, but also of liveability, civilian infrastructure and compounding impacts. The general conditions and degradation of services and infrastructure will make it extremely difficult to impossible for the families of Defence personnel.

To some extent such issues can be handled by moving to fly-in, fly-out (FIFO) operation. However, as with the oil and gas industry, the climate ahead is likely to be more extreme than anything humans have previously experienced.

Have these issues been fully considered by the government? In 2016, Defence undertook a study of the effects of climate change on northern bases, but the impact of that work is unclear.

It is not a question about whether military forces can operate in extreme climates: they do and have, including in Iraq and Afghanistan and Vietnam, with special measures to deal with the extreme conditions. There are many places where one may choose to fight a war, but not wish to live or work or choose to locate large numbers of defence personnel in peace time due to the harshness of conditions. Northern Australia in the future will be one of those places.

40 nature.com/articles/s41893-023-01132-6

THIS IS URGENT!

Faster than forecast, the risks manifest

There is now clear evidence that the rate of climate warming is accelerating,[41] and that most policymakers' expectations of future warming are now dangerously conservative.

2023 was an extraordinary year for climate change. UN Secretary-General Antonio Guterres described it as the year in which humanity crossed into a new climate era, the age of "global boiling".[42]

2023 was the first year 1.5°C warmer than the 1850-1900 baseline, and both Antarctic sea-ice loss and record northern hemisphere sea-surface temperatures were way beyond the ranges projected by scientific modelling.

Datasets of global temperatures vary a little depending on method, but two of the most significant are Berkeley Earth which put 2023 at 1.54°C above the pre-industrial (1850-1900) level,[43] and Copernicus/ECMWF at 1.48°C.[44] Berkeley said that "a single year exceeding 1.5°C is a stark warning sign of how close the overall climate system has come to exceeding this Paris Agreement goal. With greenhouse gas emissions continuing to set record highs, it is likely that climate will regularly exceed 1.5°C in the next decade."[45]

Many records were broken for new climate extremes — record heat, rainfall and floods — with some of it driven by the destabilisation of the Arctic polar jet stream. "We are hitting record breaking extremes much sooner than I expected," said Sarah Perkins-Kirkpatrick of the University of NSW.[46]

What happened in 2023 was not what scientists' models anticipated at the beginning of the year and fell well outside the confidence intervals of any of the estimates.[47] Carbon Brief says that "while there are a number of factors that researchers have proposed to explain 2023's exceptional warmth, scientists still lack a clear explanation for why global temperatures were so unexpectedly high… researchers are just starting to disentangle the causes of the unexpected extreme global heat the world experienced in 2023".[48]

One explanation comes from former NASA climate science chief James Hansen who warns that warming will accelerate to 1.7°C by 2030 and "2°C will be reached by the late 2030s".[49]

For some time Hansen and his colleagues have been saying that the impact of sulfate aerosols — which are a byproduct of burning fossils fuels, cause acid rain, and have a strong but short-term cooling effect by reducing incoming radiation — is much greater than generally stated, so that producing less of them under "clean air" policies will actually contribute to accelerated warming. Whilst the orthodox estimates for aerosols are around 0.5°C of cooling, Hansen and his colleagues consider it is likely above 1°C.

Thus the efforts since 2020 to clean up maritime shipping emissions by mandating fuel with much lower sulfur content resulted in a "Faustian bargain": as the sulfate cooling impact has reduced, greater warming has been revealed. This was allied with continuing high human greenhouse emissions, and the effects of the developing El Nino, to produce the 2023 heat records.

41 independent.co.uk/news/ap-world-meteorological-organization-baltimore-james-hansen-north-america-b2492342.html
42 news.un.org/en/story/2023/07/1139162
43 berkeleyearth.org/global-temperature-report-for-2023
44 climate.copernicus.eu/copernicus-2023-hottest-year-record
45 berkeleyearth.org/global-temperature-report-for-2023
46 theguardian.com/environment/2023/aug/28/crazy-off-the-charts-records-has-humanity-finally-broken-the-climate
47 theclimatebrink.com/p/2023s-unexpected-and-unexplained
48 carbonbrief.org/state-of-the-climate-2023-smashes-records-for-surface-temperature-and-ocean-heat
49 mailchi.mp/caa/how-we-know-that-global-warming-is-accelerating-and-that-the-goal-of-the-paris-agreement-is-dead

Several years ago a group of eminent scientists proposed a "carbon law", which stated that keeping warming to 2°C required emissions to be halved *every* decade from 2020 onwards, with additional drawdown of carbon from the atmosphere.[50]

Instead, the level of greenhouse gases and coal use both hit record highs in 2023. And the largest national fossil fuel producers around the world plan to keep on expanding production, whilst major fossil fuel companies backtrack on their climate pledges.[51] As a result, current government plans worldwide will likely result in emissions in 2050 almost as high as they are today, according to the UN Environment Programme's 2023 *Production Gap* report.[52]

This outlook suggests Earth is heading towards 3°C of warming and perhaps a good deal more, because current climate models which project warming of around 2.7°C do not adequately account for all the system-level reinforcing feedbacks. In 2021, the pre-eminent UK international affairs think tank Chatham House described a "plausible worst-case scenario" of 3.5°C or more. Even this could be an underestimate if tipping points are reached sooner than the orthodox science has predicted.[53] This now appears to be the case.

A clear majority of scientists expected warming of more than 3°C, and 82 per cent expected to see catastrophic impacts of climate change in their lifetime, according to a 2021 survey by the journal *Nature*.[54]

In 2018, a group of eminent scientists explored the potential — once warming had exceeded the 1.5-2°C range — for self-reinforcing positive feedbacks in major elements of the climate system to push past a planetary threshold that would prevent temperature stabilisation, and drive the system to a "Hothouse Earth". They warned_that "we are in a climate emergency… this is an existential threat to civilisation".[55]

In the *2023 State of the Climate Report: Entering uncharted territory,* 12 researchers warned of "potential collapse of natural and socioeconomic systems in such a world [of 2.6°C warming] where we will face unbearable heat, frequent extreme weather events, food and fresh water shortages, rising seas, more emerging diseases, and increased social unrest and geopolitical conflict".[56]

Amongst scientists the understanding is increasingly shared that contemporary nations and societies, and likely the global social system, are heading towards collapse if the current high-emissions path continues even for two or three decades.

50 science.org/doi/10.1126/science.aah3443
51 smh.com.au/environment/climate-change/we-should-abandon-the-fantasy-oil-giants-scale-back-climate-pledges-20240327-p5ffoz.html
52 unep.org/resources/production-gap-report-2023
53 chathamhouse.org/2021/09/climate-change-risk-assessment-2021
54 nature.com/articles/d41586-021-02990-w
55 nature.com/articles/d41586-019-03595-0
56 academic.oup.com/bioscience/advance-article/doi/10.1093/biosci/biad080/7319571

CASE STUDY 3

OCEAN CIRCULATION COLLAPSE

There is no greater disruptive physical climate risk than the collapse of the Atlantic meridional overturning circulation (AMOC), the main current system in the South and North Atlantic Oceans, which is linked to circulation in the Southern Ocean.

There is a non-trivial and unacceptable risk that the AMOC flow will collapse this century, with devastating consequences for global food production, for sea levels and for flooding in Australia. Shifts in global weather patterns would likely deprive Asia of vital monsoon rains, with enormous security consequences for the region and for Australia.

Yet in the government's analysis of climate risks, no attention has been paid to the AMOC collapse. In fact, it does not get a mention in the DSR, or the first pass of the NCRA. No minister or member of either major party has even mentioned it in parliament since the ALP came to power. One of the greatest climate-related threats to our future appears completely absent from the government's thinking.

AMOC slowdown: AMOC is the complex web of ocean current conveyor belts which, driven by differences in water density, transports water, heat and nutrients throughout the Atlantic Ocean, and which takes "a lot of heat from the tropics in the Atlantic, moves that heat up to Northern Europe, and releases that heat to the atmosphere, keeping that part of the world much more mild in its climate".[57] It has been in a steady state for thousands of years, but climate change is melting Greenland at an accelerating rate, adding more fresh water to the Atlantic Ocean and gradually slowing the circulation strength. At a critical point, with continuing high emissions, this slow-down will accelerate past a tipping point, resulting in the AMOC collapse, or cessation. This system has already slowed by 15 per cent since the mid-20th century.[58]

Collapse: In 2021 researchers concluded that there is "strong evidence that the AMOC is indeed approaching a critical, bifurcation-induced transition" (in other words, a tipping point) but the timing was unclear.[59] A July 2023 study estimated "a collapse of the AMOC to occur around mid-century under the current scenario of future emissions", with a high confidence (95 per cent probability) of it occurring between 2025 and 2095.[60] Potsdam University's Prof. Stefan Rahmstorf observes that while there is still "large uncertainty where the tipping point of the AMOC is... the scientific evidence now is that we can't even rule out crossing a tipping point already in the next decade or two".[61]

57 sbs.com.au/news/podcast-episode/climate-change-threatening-the-conveyor-belt-of-the-ocean/j082tdvq4
58 nature.com/articles/s41561-021-00699-z
59 nature.com/articles/s41558-021-01097-4
60 nature.com/articles/s41467-023-39810-w
61 edition.cnn.com/2023/07/25/world/gulf-stream-atlantic-current-collapse-climate-scn-intl/index.html

Antarctic connection: Consistent with this analysis, Australian researchers in March 2023 published projections showing Antarctic deep ocean warming and changes in deep ocean circulation contributing to a slowing of the AMOC over the next few decades, with physical measurements confirming these changes already well underway. They warn that the currents "may even collapse" and, if this happens, this would "deprive the deep ocean of oxygen, limit the return of nutrients back to the sea surface, and potentially cause further melt back of ice as water near the ice shelves warms in response. There would be major global ramifications for ocean ecosystems, climate, and sea-level rise."[62]

Likelihood: The authors of this 2023 paper write that their "central estimate, situated at the mid-century, is where we believe that there is the highest risk of a collapse should we continue greenhouse gas emissions at the current rate".[63] Rahmstorf warns that "when several studies with different data and methods point to a tipping point that is already quite close, I think this risk should be taken very seriously" and "increasingly the evidence points to the risk being far greater than 10 per cent during this century - even rather worrying for the next few decades".[64]

Consequences: Modelling by Prof. Peter Ditlevsen of the University of Copenhagen shows that AMOC slowdown would cool London by an average of 10°C and Bergen, Norway by 15°C.[65] A breakdown of this system could plunge the UK and large parts of the Northern Hemisphere into a new ice age, with temperatures in parts of Europe dropping by 3°C each decade and sea levels rising by a metre on both sides of the North Atlantic, while the wet and dry seasons in the Amazon would flip and severely disrupt the rainforest's ecosystem.

Global food and water security crisis: Ditlevsen and his co-authors conclude that a collapse of the AMOC heat-transporting circulation would be a going-out-of-business scenario for European agriculture: "You cannot adapt to this".[66] In addition, writes Prof. Tim Lenton, the director of the Global Systems Institute at the University of Exeter, the monsoons that typically deliver rain to West Africa and South Asia would become unreliable, and huge swaths of Europe and Russia would be devastated by drought. As much as half of the world's viable area for growing corn and wheat could dry out. "In simple terms [it] would be a combined food and water security crisis on a global scale."[67]

Consequences for Australia: The southern hemisphere, including Australia, would become warmer and more prone to flooding. A regional food crisis would have huge impacts on the global price of food, leading to large-scale regional people displacement and contributing to state breakdown and regional conflict.

The NCRA is limited to looking only at adaptation responses, even though scientists working for government agencies privately acknowledge that 3°C of warming — which would be the result of the current high-emissions trajectory — is likely beyond adaptation. The only rational response to possible AMOC collapse is a global emergency effort to reduce emissions to zero far sooner than policymakers' 2050 timeframe, along with whatever other measures can be applied to prevent the levels of warming triggering such an event.

These necessary actions should already be the subject of discussion for action at the highest levels in the Australian government, and already flagged by Australia's climate risk assessment processes, but there is no sign that has yet occurred.

62 theconversation.com/torrents-of-antarctic-meltwater-are-slowing-the-currents-that-drive-our-vital-ocean- overturning-and-threaten-its-collapse-202108
63 theconversation.com/atlantic-collapse-qanda-with-scientists-behind-controversial-study-predicting-a-colder-europe-211221
64 realclimate.org/index.php/archives/2023/07/what-is-happening-in-the-atlantic-ocean-to-the-amoc/
65 commondreams.org/news/amoc-current-collapse-2667230243
66 insideclimatenews.org/news/09022024/climate-impacts-from-collapse-of-atlantic-meridional-overturning-current-could-be-worse-than-expected/
67 independent.co.uk/climate-change/news/earth-western-europe-hollywood-canada-scientists-b2493789.html

CASE STUDY 4

WORDS MATTER

One line of evidence for the government's seriousness about climate-security risks is government activity, but there is little to see. The government's most valuable initiative, the ONI risk assessment, has been buried. There have been no significant or specific announcements on climate-related security issues since the report was finished, and the government has not responded to a number of requests made by ASLCG for the report's release of any of its key findings.

Ministers visiting the Pacific say that Australia recognises climate is a big issue for Pacific nations and takes that seriously, whilst simultaneously overseeing a major expansion of the gas industry. The Pacific pitch is designed to meld small Pacific states into the bigger anti-China strategic alliance led by the United States, and to disrupt Chinese influence in the region. But climate, not China, is the greatest risk to our future.

A government that verbally recognises the "existential" nature of the climate-security threat would also accept the responsibility to educate Australian people on this threat and take actions necessary to address it.

When a government identifies a large threat to Australian security, their usual mode is to build the case to act by going out of their way to talk about it. For example, both the government and the opposition have given inordinate attention to talking up the "China threat"; AUKUS is in practical terms about the "China threat", and "Indo-Pacific" a codeword for "contest with China". Looking back, there was an all-out effort by the Howard government to convince Australians that Iraq's (mythical) weapons of mass destruction justified going to war. And before that the much-vaunted "domino theory" was used to justify Australia's participation in the Vietnam War.

But the climate threat? Not a priority. An analysis of the number of discrete media events (speeches, media transcripts, media releases and statements) by Defence Minister Marles in which he has referenced China (and related codewords), compared to climate, is revealing.

To early March 2024, Marles had referenced the Indo-Pacific on 158 occasions, China 221, America 129 and AUKUS 202. By way of comparison, climate change appears 49 times, the word existential 12 times, and sea-level rise — the greatest climate concern of the Pacific — on just two occasions.

The DSR, co-chaired by a former Labor foreign minister, included a section on climate change of just 252 words, most related to minimising any increased role for the Defence Force in disaster relief. There were no recommendations bar those relating to getting Defence out of emergency responses and using more renewable energy. On the big climate-security picture — described by Chatham House as cascading climate impacts that will drive political instability and fuel regional and international conflict — there was not a single recommendation.

Climate as a primary security issue? Not in this "strategic" review.

The government's climate communications strategy is clear. In the international arena, make China the big story and climate a subsidiary one. Domestically, it is even more stark. The government is making the climate story about renewable energy and jobs, along with the "strategic" importance of gas expansion, whilst talking about the actual and projected climate impacts as little as possible.

Climate Change and Energy Minister Chris Bowen has referred to renewable energy on 373 occasions (up to 10 March 2024), with big numbers for battery (133), storage (165), hydrogen (143), coal (172), pumped hydro (32) and renewable energy superpower (105).

The climate emergency rated 32 mentions and extreme weather or heat 15. But drill down to the specific impacts of climate change and the cupboard is bare. Sea levels get nine mentions, Antarctica — one of the fastest warming places on Earth and where Australia claims a large territory — rated four mentions, and the Great Barrier Reef (GBR), now in a death spiral, just one. Words relating to key climate systems — tipping points, permafrost, the slowing Atlantic circulation, the Amazon and extinction — score zero mentions.

In February and March 2024, the GBR experienced the most severe bleaching and coral death on record due to unprecedented hot ocean temperatures. Bleaching after bleaching, the World-Heritage-listed reef is dying. And what did the responsible minister, Tanya Plibersek, say about these global news-worthy events? Not a word. Her ministerial website records just three mentions of the reef over those two months — all in the first half of February — and they related to the appointment of a "New Chair for Reef 2050 Independent Expert Panel", the delivery of a progress report on the Reef to UNESCO, and Great Barrier Reef Wetlands Strategy; all of which are part of ongoing political contortions to avoid the reef being placed on the UNESCO "endangered" list, when in reality it is dying.

There is good evidence that we need to be honest and forthright about the climate problem. Counterposing "fear" and "hope" narratives is a false dichotomy, because both are needed. Public health promotion campaigns such as "quit smoking" show that the messages that work best combine a personally relevant description of the threat (fear), and a clear exposition of the solution with a clear path of achievable actions to address it (hope).[68]

Research also shows that increased commitment to taking action can be achieved by just reading a climate message that forthrightly describes the seriousness of our situation. Strong fear messages have been found to be more effective than weak fear messages; when fear is combined with hope, this can create an emotional drive that motivates a change of habit.[69] And climate anxiety is an important driver for climate action.[70]

And the lesson? You can't solve a problem — in this case the biggest threat humanity has ever faced — without talking about it honestly and leading the conversation.

Coral bleaching on the Great Barrier Reef, Port Douglas, Far North Queensland

68 tandfonline.com/doi/abs/10.1080/147428 37.2017.1344546
69 sciencedirect.com/science/article/pii/ S0272494415000249
70 sciencedirect.com/science/article/pii/S0272494422001116?via%3Dihub

POSITIVE STEPS

An integrated National Climate–Security Strategy

Our collective challenge is to make human security generally, and the Australian community's security specifically, central to the duty of government to protect the people, recognising that securitising climate threats through enhanced militarisation and claims to national security secrecy are not a coherent response.

The focus should be on the root causes of climate warming, principally eliminating emissions much faster than the net-zero-by-2050 goal, drawing down the levels of atmospheric carbon and actively cooling the planet, rather than solely responding to the symptoms of floods, fires and related disasters as we are currently doing.

Climate impacts disproportionately fall on the most vulnerable and socio-economically disadvantaged communities. Building their capacity to withstand and respond to climate shocks is a key task in ameliorating climate-security risks, both in Australia and globally, *inter alia* preventing social breakdown, conflict and forced displacement.

Climate research in Australia is not planned or integrated in a manner that will deliver the information required for realistic risk assessment and government policy-making. As a result Australia's climate modelling is not as effective as it needs to be. The lack of coordination is worsened by bureaucratic silos and competing interests.

Rapidly changing physical circumstances and inadequate risk analysis mean that advice to the government on climate risks often is out-of-date, of questionable quality and lacking systemic insight. Australia urgently requires an integrated National Climate-Security Strategy which would require leadership from an eminent, independent expert advisory group.

As this report has documented, some of governments' most notable risk-management failures have been due to "thinking in silos" and not adopting a coordinated, whole-of-government or whole-of-system approach to understanding risk, with an emphasis on the "risk of ruin". The need to integrate risk analysis, policies and action across federal government departments, and between all levels of government, cannot be overemphasised.

On climate action, global cooperation — not conflict — is key. Harvard professor and former US Treasury secretary Lawrence Summers maintains that coronavirus helped "to usher in a world where security depends more on exceeding a threshold of cooperation with allies and adversaries alike than on maintaining a balance of power".[71] Likewise with climate change.

ASLCG recommends the following action to build an Integrated National Climate-Security Strategy:

- **Plan and integrate** climate research in Australia in a manner that will deliver what the government needs for realistic risk assessment and policy-making, under the guidance of an independent expert group.
- **Rebuild** the climate policy-making capacity of the Australian Public Service and overcome the bureaucratic silos that are making systemic analysis of climate-security risks almost impossible to achieve.
- **Establish** a Climate Threat Intelligence branch within ONI, with outputs including an annual, de-classified briefing to Parliament.
- **Assess** the threats and impacts of climate disruption with brutal honesty, identifying the worst, as well as most likely, cases and considering the full range of probabilities, consistent with the approach outlined on page 5.
- **Establish** an Abrupt Climate Change Early Warning System.[72]
- **Legislate** a Global Catastrophic Risk Management Act .[73]
- **Publish** a declassified version of the ONI assessment of climate and security risks.

71 Summers, L 2020, 'Covid-19 looks like a hinge in history', Financial Times, 14 May.
72 agupubs.onlinelibrary.wiley.com/doi/abs/10.1002/2013EO510003
73 uscode.house.gov/view.xhtml?req=granuleid%3AUSC-prelim-title6-chapter2-subchapter2-partF&saved=%7CImNhdGFzdHJvcGhpYyByaXNrIg%3D%3D%7CdHJlZXNvcnQ%3D%7CdHJ1ZQ%3D%3D%7C4%7Ctrue%7Cprelim&edition=prelim

CONCLUSION

Refusing to confront Australia's future is a form of climate denial

In a hotter world, some parts of the Earth presently inhabited will be practically unliveable due to extreme temperatures combined with high humidity. Those areas include Amazonia, around the Red Sea and the Persian Gulf, stretching to parts of South Asia, and areas of northern Australia and Papua New Guinea. Yet Australia seems hell-bent on walking into the furnace, especially with its policy settings for northern Australia.

Climate disruption now presents an existential threat to society and human security. In vulnerable countries it has contributed to the collapse of governments and civil wars erupting, forcefully displacing millions searching for a safe haven.

Responding adequately to the threat is fundamental to the survival of the nation and the global community. But inadequate assessment by a succession of Australian governments has left our nation with a poor understanding of the looming climate risks, and poorly prepared to face the consequences. Australia remains "missing in action" on climate-security risks, with climate downplayed to a cameo role in defence and security policy and planning, whilst the government oversees the expansion of the gas export industry.

Is this the consequence of decades of political "climate wars" and the power of the fossil fuel lobby? Yes, to some extent. But it is also a product of systemic failure of leadership across government and business — a failure of imagination and the capacity to "think the unthinkable" or "think outside the box".

How many of those leaders actually grasp the risk of ruin in their decision-making? There is no better example in relation to climate than former Royal Dutch Shell CEO, Ben van Beurden's admission: "Yeah, we knew. Everybody knew. And somehow we all ignored it."[74]

Stripped of climate expertise by the previous government, the Australian Public Service has barely any capacity to understand, coordinate or advise appropriately on the full range of climate risks. It will take years of effort to rebuild capacity across the government. And climate research is not planned or integrated in a manner that will deliver what the government needs for realistic risk assessment and policy-making. As a result Australia's climate modelling is not as effective as it needs to be.

But these problems can be fixed without great expense or provoking political war. So can the modest suggestions in this report to make the government fit-for-purpose on addressing these risks — overcoming the bureaucratic silos, establishing a dedicated Climate Threat Intelligence, establishing an Abrupt Climate Change Early Warning System and legislating a Global Catastrophic Risk Management Act.

The failure to take these basic steps would simply be yet another form of climate denial, of not wanting to understand the future that Australia faces.

74 van Beurden, B 2020,'The reason fossil fuel companies are finally reckoning with climate change', Time, 16 January.

APPENDIX: KEY ACTIONS

An integrated, whole-of-government understanding of the risks

- Recognise that climate disruption is an existential risk to human civilisation, and the greatest security threat to Australia and to societies around the world, requiring an emergency mobilisation in response.
- Establish a Climate Threat Intelligence Unit within the Office of National Intelligence (ONI), with outputs including an annual, de-classified briefing to Parliament.
- Establish an Abrupt Climate Change Early Warning System coordinated by the Climate Threat Intelligence Unit.
- Plan and integrate climate research in Australia in a manner that will deliver what the government needs for realistic risk assessment and policy-making; and rebuild the climate policy-making capacity of the Australian Public Service;
- Overcome the bureaucratic silos that are making systemic analysis of climate-security risks almost impossible to achieve.
- Implement an integrated climate risk-management methodology across government, based upon a strategic global perspective of climate risk that avoids silos and recognises the systemic, cascading nature of the climate threat.

Leadership

- Take leadership in encouraging national and international preparedness and prevention (emissions mitigation) to address the climate threat, and in engaging the Australian community about climate-security risks.
- Make human security and the Australian community central to the duty of government to "protect the people", recognising that securitising climate threats through enhanced militarisation and claims to national security secrecy are not a coherent response.
- Build an Australian National Prevention and Resilience Framework with coherent emergency processes across relevant areas including energy and water, logistics, health, industry and agriculture, research and nature.

Regional cooperation and support

- Understand that global cooperation rather than conflict is key to responding to the climate crisis, and act accordingly by building alliances with big and small Asia-Pacific governments for a regional climate mobilisation.
- Increase support for developing nations to facilitate their preparedness and prevention plans.
- Partner with nations in the region to deploy a monitoring system to identify potential food insecurity hotspots, and fund enhancement of food, supply chain and energy resilience in the region.

Protect and prevent

- **Adopt a goal to protect** the most vulnerable communities, nations and natural systems.
- **Recognise** that the most damaging climate impacts occur at the high end of the range of possibilities, and ensure mitigation actions are consistent with avoiding the plausible worst-case scenarios.
- **Prevent** devastating climate impacts by mobilising all the resources necessary to reach zero emissions as fast as possible. Develop the capacity to prevent irreversible tipping points and draw down greenhouse gases back to safer conditions in the long term.

Australian Defence Force Live Fire Training Exercise (Photo: Ian Hitchcock/Getty Images)

LET ME JUST MAKE ONE POINT VERY CLEAR: 2.7°C IS WITHOUT ANY DOUBT A DISASTER. IT'S A POINT WE HAVEN'T SEEN FOR THE PAST 5 MILLION YEARS. THERE'S NO EVIDENCE THAT WE CAN SUPPORT HUMANITY AS WE KNOW IT ON A 2.7°C PLANET.[75]

Johan Rockström,
Director Potsdam Institute for Climate Impact Research

75 news.mongabay.com/2024/02/planetary-boundary-pioneer-johan-rockstrom-awarded-2024-tyler-prize/

Safe
Climate
Australia