Sherri Goodman
Woodrow Wilson International Center,
1300 Pennsylvania Ave NW,
Washington DC 20004
USA
email:

28 July 2017

To:

Senate Foreign Affairs, Defence and Trade Committee
PO Box 6100, Parliament House
Canberra ACT 2600
AUSTRALIA
Email: fadt.sen@aph.gov.au

In response to your request of 23 June 2017, please find attached a submission to the inquiry into the implications of climate change for Australia's national security.

I note that terms of reference (a) refers to "threats and long-term risks posed by climate change to national security and international security, including those canvassed in the *National Security Implications of Climate-Related Risks"*, and wish the inquiry to note that this report was published in 2014 by the CNA Military Advisory Board, of which I am the Founder, and that I was Executive Director at the time that report was prepared.

Sincerely,

Sherri Goodman
Former US Deputy UnderSecretary of Defense (Environmental Security)
Founder and first Executive Director, CNA Military Advisory Board
Senior Fellow, Woodrow Wilson International Center, Washington
Senior Advisor for International Security, The Center for Climate and Security, Washington

SUBMISSION BY SHERRI GOODMAN

Former US Deputy UnderSecretary of Defense (Environmental Security)
Founder and first Executive Director, CNA Military Advisory Board
Senior Fellow, Woodrow Wilson International Center, Washington
Senior Advisor for International Security, The Center for Climate and Security, Washington

TO

Australian Senate

Foreign Affairs, Defence and Trade Committee

INQUIRY INTO THREATS AND LONG-TERM RISKS POSED BY CLIMATE CHANGE TO NATIONAL SECURITY AND INTERNATIONAL SECURITY

28 July 2017

SUMMARY OF RECOMMENDATIONS

1. Recognise climate change as a global existential risk, and a direct threat to the national security of Australia, and direct the Australian Department of Defence to report regularly on vulnerabilities to military installations, and combatant commander requirements, across the full spectrum of planning and operations.

2. Make climate-fragility risks a central foreign policy priority by integrating climate-fragility responses into planning, implementation, and evaluation processes across Australian Government departments, recognising that this requires new capacities within departments and new cross-sectoral policy processes, and direct the government to report regularly on the development of climate-strategic evaluation capacity, and policy and process integration.

3. Incorporate climate change and security risk awareness, analysis and response into Australia's mil-mil and civ-mil engagement with partner nations: initiate dialogue, establish and expand links with critical stakeholders, and build an international community of practice around addressing climate security risks. This should include but not be limited to engagement around Disaster Risk Reduction and Humanitarian Assistance and Disaster Response, as many nations primarily understand the security risks of climate change in terms of short-term crises and impacts on infrastructure, failing to appreciate the high probability, high-impact threats that climate change poses to national and international security.

4. Australia join a global effort to improve capacity to predict the likely locations of violent disruptions fueled in part by the consequences of climate change, including by increasing funding for key Australian institutions including CSIRO, the Bureau of Meteorology and the university sector to enable better understanding of changing climate dynamics.

5. Recognise that strengthening the resilience of vulnerable nations to the climate impacts already locked into the system is critical, but this will only reduce long-term risk if improvements in resilience

are accompanied by strong actionable agreements to stabilise the climate. In this context, Australia should:

- ensure that its commitments to the Green Climate Fund are fully funded, and that additional measures are taken to support resilience-building in vulnerable nations, especially in the Asia-Pacific region;
- Urgently review, and urge key global partners to review, Intended Nationally Determined Contributions to bridge the gap between the Paris climate agreement's goals and practical outcomes.

5. Make infrastructure investments that protect coastal communities. Any national infrastructure initiative should prioritize funding for projects that boost coastal resilience. New coastal infrastructure projects should build resilience into all aspects of design and engineering. This is critical for projects such as ports, roads, bridges, power grids, and wastewater treatment plants, among others.

PROFESSIONAL EXPERTISE

Thank you for the opportunity to make a submission to this inquiry. I've been working at the nexus of national security, science and the environment in the United States for 30 years. I served as the first Deputy Undersecretary of Defense (Environmental Security) for eight years in the 1990s. Since then I have served in executive leadership positions at a number of national security and science organizations, including CNA (Center for Naval Analyses), the Consortium for Ocean Leadership, and the Woodrow Wilson International Center.

- Ten years ago I founded the CNA Military Advisory Board, by organizing a dozen retired 3- and 4-star generals and admirals to look specifically at the national security implications of climate change -- we were the **first security organization to recognize and clearly identify climate change as a threat multiplier,** a phrase I personally coined**.** Our work was informed by the science conducted and supported by the key US agencies, including NSF, NOAA, NASA, and many others.
- Three years ago I worked with a similar group of retired generals and admirals at CNA to reexamine this issue and we concluded that **climate change is a catalyst for conflict and an accelerating risk**.
- I've subsequently began to focus my attention on the security risks of climate change as manifested by impacts on water, the oceans and the Arctic.
- I am also a member of the US Joint Ocean Commission Initiative, a bipartisan group of senior ocean leaders that brings together all sectors of the ocean community to catalyze action and monitor progress toward meaningful ocean policy reform. The Joint Initiative has recently released an Ocean Action Agenda which contains priority recommendations that address coastal security issues in the face of a changing climate and encourages leadership in the Arctic.

- In April 2017, I visited Australia for a speaking and engagement tour of Sydney, Canberra and Melbourne. I met met with four senior political figures, spoke at three public events, led four roundtables (with federal government departments including defence, at the ANU, and in Melbourne), participated in two senior business leaders private discussion/dinners, met with senior Australian national security analysts, and senior civilian and uniformed ranks in the Department of Defence, engaged in events organised by three Australian national security think tanks, and conducted nine media interviews. The tour was significant in advancing climate security awareness in Australia. I feel confident that I had a constructive and enduring impact across the many communities that the tour organisers, The Breakthrough National Centre for Climate Restoration, were hoping to influence with my visit: opinion and business leaders; key government officials, in particular, creating a "reach-back" network for key Defence officials; other interagency players; elected officials; media throughout the week and even some unexpected audiences, like 350-plus professionals at the Women and National Security conference. It was an amazing job to bring the climate security message to many key audiences in Australia. Australia is at an inflection point in its approach to climate and energy security, and I believe my visit enabled the conversation to move forward in a more dynamic and constructive way.

OVERVIEW

Let me begin by recognizing the views of those who say "the climate has always been changing so why should we do anything about it now?" Yes, the climate does change, but for the last 10,000 years it has been relatively stable. What we do know is that climate change has NEVER impacted eight billion people – the way it will in the coming decades. **That is the major concern – understanding climate change is about lowering the risk to the eight billion people who will have to live through the change.** That is what we have been trying to understand and explain for the last 10 years.

In 2007 our distinguished group of senior retired military leaders, constituted as the CNA Military Advisory Board, found that:

- Projected **climate change poses a serious threat** to America's national security. **This conclusion is equally applicable to Australia.**
- Climate change acts as a **threat multiplier** for instability in some of the most volatile regions of the world
- Projected climate change will **add to tensions** even in stable regions of the world
- **Climate change, national security, and energy dependence** are a related set of global challenges

Seven years later, in 2014, despite progress at state, national and international levels in both mitigation and adaptation, the MAB was compelled to gather again because of their growing concern that comprehensive action by both the U.S. and the international community was not happening with the

urgency and thoroughness the full spectrum of climate change issues require. In our report, *National Security Implications of Climate-Related Risks,* which is specifically referenced in your terms of reference (a), we found:

- Climate change remains a threat multiplier. In many areas the threats are manifesting faster than anticipated and the **risks are accelerating**.
- The potential security ramifications of global climate change should be serving as catalysts for cooperation and change. Instead, climate change impacts are already acting to accelerate instability in vulnerable areas of the world and are serving as **catalysts for conflict**.
- Rapid population growth, especially in coastal and urban areas, and complex changes in the global security environment have made understanding the strategic security risks of projected climate changes more challenging. When it comes to thinking about the impacts of climate change, **we must guard against a failure of imagination**.
- As the world's population and living standards continue to grow, the projected climate **impacts on the nexus of water, food, and energy security become more profound**. Fresh water, food, and energy are inextricably linked, and choices concerning how these finite resources will be produced, distributed, and used will have increasing security implications.
- Climate change impacts, both current and projected, will continue to challenge key elements of our national power and encumber our homeland security – this is true for both the US and Australia. Of particular concern are climate impacts on military, infrastructure, economic and social support systems.
    - Military. The impacts of **climate change are detrimental to military readiness**, strain base resilience both at home and abroad, and may limit our ability to respond to future demands. Given the forward presence of the US military around the world, there will be an **increased demand for the military to provide humanitarian assistance and disaster relief**, both at home and abroad. Australia is also facing the same increased demand, such as responding to the record-breaking cyclones in the south Pacific in recent years.
    - Infrastructure. The impacts of projected climate change can be detrimental to the physical components of our national critical infrastructure, while also limiting their capacities. **Infrastructure protection planning documents should have more explicit projected scenarios**.

The US defense and intelligence community has found that climate change presents significant global security challenges, which are relevant to both US and Australian security and national interests. Climate change will likely pose significant national security challenges for Australia over the next two decades. The former chief of the Australian Defence Force, Ret. Admiral Chris Barrie has said that: "neither the world nor Australia are prepared for the serious, large-scale impacts of climate change on vulnerable communities and refugee patterns".[1] The 2016 US National Intelligence Council Assessment, *Implications for US National Security of Anticipated Climate Change,* found that "climate change will likely pose significant national security challenges for the United States over the next two

[1] Sturrock, R., and P. Ferguson (2015) The Longest Conflict: Australia's climate security challenge, Centre for Policy Development, Sydney, p. 19

decades".[2] Recently the US Congress called climate change "a direct threat to the national security of the United States," and directed the US Department of Defence to report on "vulnerabilities to military installations and combatant commander requirements".[3]

The US National Intelligence Council report also identified six pathways for disruption and conflict from climate change. Now the challenge is to translate that initial assessment into actionable guidance for national security policymakers and military planners.

That paints the overall picture, so let me also focus on the Arctic and oceans**.**

THE ARCTIC

Accelerated melting of "old ice" in the Arctic is making the region more accessible to a wide variety of human activities including shipping, resource extraction, fisheries, tourism and other commerce. This activity level will accelerate in the coming decades. Given the vast expanse of the Arctic, this increased accessibility possess unique search and rescue challenges. **The United States and the international community are not prepared for the pace of change in the Arctic**.

- In 2012, the level of ice coverage in the Arctic was the lowest on record by more than one million square miles. 2017 is on pace the beat that record. While annual figures vary, the overall trend is clearly toward less ice coverage. In addition, the thickness of the ice is also decreasing, so that sea-ice volume is on a consistent downwards trajectory.
- The Arctic is rich in resources, and less ice will mean that valuable resources and shorter transit routes will be increasingly accessible. China is already increasing its foreign direct investment in Greenland and Iceland to secure rare earth minerals and other resources it needs to feed its growing economy and population.
- In 2016 we started to see cruise ships filled with tourists transiting and "vacationing" in the Arctic.
- Nations, corporations, and even individuals will be anxious to exploit the opening Arctic region, even if they have to accept higher levels of risk than in other areas of the world. The Bering Strait between Alaska and Russia is only 30 miles wide at its narrowest point, and will most likely see increased activity as it becomes navigable for longer periods.
- While the United States and the international commu-nity prepare for more Arctic activities in the future, the **increased activity today brings high levels of risk to that fragile area**.
- Indeed, changes already affecting human communities include reduced food security (due to the loss of whaling, sealing, and other native harvesting practices), more severe storm damage, and increased local environmental threats from new activities.

[2] National Intelligence Council (2016) *Implications for US National Security of Anticipated Climate Change*, Office of the Director of National Intelligence, Washington

[3] Doubleday, J. (2017) "House defense authorizers direct Pentagon to report on plans for climate change", *Inside Defence*, 25 July 2017, https://insidedefense.com/daily-news/house-defense-authorizers-direct-pentagon-report-plans-climate-change

- As the US House of Representatives has recently noted in its Sense of Congress amendment to H.R. 2810, “In the Arctic, the combination of melting sea ice, thawing permafrost, and sea-level rise is eroding shorelines, which is damaging radar and communication installations, runways, seawalls, and training areas.”

Closer to Australia, Antarctica has many similar features: a warming climate especially for West Antarctica, retreating glaciers, more cruise ships, and growing international interest in its economic future.

OCEANS

The most obvious manifestation of climate change can be seen on land where rain patterns are changed and temperatures rise. But it is the **oceans that may have the largest impact on society**.

- Just as it did millions of years ago, as the temperature of the ocean increases it will expand and sea level will rise. Add to that melting glaciers and ice sheets on Greenland and Antarctica and we could see anywhere from one to 1.5 meters over the next 80 years. This will **swallow low lying islands in the Pacific, but as importantly it will impact <u>billions</u> of people who live near the coasts and in the world’s megacities**. This will impact the Mekong delta – the bread basket of Asia, and the fertile Nile delta – leading over a million Egyptians to have to migrate – and countless other areas around the world. 16 of 20 the most populated urban areas in the world are on the coast. We have already seen the security ramifications of climate induced migration in Syria and the future will bring more climate induced migration. The Asia-Pacific will experience significant population movements as a result of sea level rise; how these population movements are managed could have a significant impact on future security dynamics in the region.
- In many areas, changes in the oceans will have impacts long before sea level rise. Look at the Maldives as a case. More than 1000 low-lying islands with a major tourism industry (beaches and diving and fishing) are under threat. Today changes in the ocean are bleaching the coral reefs and driving the fish toward higher latitudes, away from the Maldives. Tourism and GDP are down while unemployment is up. The Maldives are already seeing large numbers of unemployed young males looking for purpose. They have seen a rise in religious extremism and rioting in the streets over suppression of women. **Climate change and the impact on the oceans is already a threat multiplier in the Maldives**.
- Warmer ocean temperatures are bleaching coral systems, as Australians have witnessed along the Great Barrier Reef over the past two summer, in which around half of the corals have been lost. The recent coral bleaching events at just 1-1.2°C of warming indicate that coral reefs are now sliding into global-warming-driven terminal decline. Three-quarters of the Great Barrier Reef has been lost in the last three decades, with climate change a significant cause. Australia's neighbours are particularly vulnerable. The Coral Triangle — encompassing Indonesia, Philippines, Malaysia, Papua New Guinea, Solomon Islands and Timor Leste — contains 76% of the world’s reef building corals and over 35% of the world’s coral-reef fish species. It is the richest place on earth in terms of biodiversity. The 100 million people who live along the coasts

of these islands depend on healthy ecosystems such as coral reefs, mangroves and seagrass beds to provide food, building materials, coastal protection, and support industries such as fishing and tourism.

- Around 85 per cent of the Australian population live in the coastal region. The Australian Government's 2009 assessment found that up to $63 billion (replacement value) of existing residential buildings are potentially at risk of inundation from a 1.1 metre sea-level rise, with a lower and upper estimate of risk identified for between 157,000 and 247,600 individual buildings. In the United States, more than 40 percent of the population lives in coastal counties, which generate almost half of U.S. gross domestic product. Unfortunately in both countries, millions reside in areas at risk for coastal flooding, putting homes, families, and critical economic resources in harm's way. Increasing coastal flooding and more intense coastal storms threaten the lives and safety of coastal residents, the integrity of public and private infrastructure, and key industries.

BUILDING RESILIENCE

In Australia's region, Asia and the Pacific, some of the worst security impacts of climate change will be experienced. Climate change will drive political instability and conflict, forced migration and humanitarian crises. During my visit to Australia in April this year, I came to understand that t**he Asia–Pacific region, including Australia, could be considered to be "Disaster Alley"** for climate impacts and their national security consequences. The flooding of coastal communities around the world, from low-lying Pacific Islands to the United States, Europe, South Asia and China, has the potential to challenge the very survival of regional communities and even some nation states.

Internationally, we must establish methods to **better forecast potentially disruptive climate changes** — such as severe drought — well in advance. Only then can we develop the capacity for reducing risks through **building global and community resilience** and strength before we encounter full-on crises. We also need to rethink refugee governance to better support those displaced by climate change impacts, who will comprise an increasing proportion of the refugee mix. Current governance structures are simply inadequate. For example, a one-metre sea-level rise in Bangladesh would likely inundate 20 per cent of the land area, and displace 30 million people. Such an eventuality would challenge some of the norms by which nations cooperate with each other respond to humanitarian crises.

Strengthening the resilience of vulnerable nations to the climate impacts already locked into the system is critical; however this will only reduce long-term risk if improvements in resilience are accompanied by **strong actionable agreements to stabilise the climate**.

Whilst the Paris climate accord's goal are to "keeping the increase in global average temperature to well below 2°C above pre-industrial levels [and] to aim to limit the increase to 1.5°C", the present commitment by governments will result in warming of 3°C or more. Such an outcome would have national security consequences so severe that some nations would cease to exist and the viability of many others would be severely challenged.

Climate change is a threat multiplier to humanity that demands **a whole-of-society response**. If Australia recognises this reality it would be placed, *inter alia*, at the leading edge of innovation and competitiveness in the advanced energy economies that are rapidly evolving in China and other Asian economies.

Responding effectively to climate change requires greatly increased co-operation globally, regionally and among Australian institutions, to build more resilient communities. Australia is at an inflection point in its approach to climate, energy and security. It is time to act with clarity and urgency.

Resilience-building also requires a specific focus on Australia's coastline and the vulnerability of public and infrastructure to inundation caused by rising sea levels and storm surges.

INTEGRATION

The US National Intelligence Council report of January 2017, *Paradox of Progress*, emphasised that that long-term thinking is critical to framing strategy, and that "In a very messy and interconnected world, a longer perspective requires us to ask hard questions about which issues and choices will be most consequential in the decades ahead–even if they don't necessarily generate the biggest headlines. A longer view also is essential because issues like terrorism, cyberattacks, biotechnology, and climate change invoke high stakes and will require sustained collaboration to address."

Long-term, consistent and integrated policy-making is central to avoiding a failure of imagination in this most vital area of national security policy-making and strategy.

An independent report commissioned by members of the G7, *"A New Climate for Peace: Taking Action on Climate and Fragility Risks",* identifies seven compound climate-fragility risks that pose serious threats to the stability of states and societies in the decades ahead. It notes that climate change is the ultimate "threat multiplier" that will aggravate fragile situations and may contribute to social upheaval and even violent conflict: "The problem is the compound risks that emerge when the impacts of climate change interact with other problems that weak states already face. The combination can overburden them. The consequences of fragility may prevent those that are most vulnerable to climate change from adapting successfully to it, thus trapping them in a vicious cycle." Hence: "Integrating policies and programs in three key sectors — climate change adaptation, development and humanitarian aid, and peacebuilding — is necessary to help strengthen resilience to climate-fragility risks and realize significant co-benefits."

Integrating policies and programs requires a whole-of-government approach, which Australia has not yet developed sufficiently.

Admiral Samuel Locklear**,** the former Commander US Pacific Command says that climate change is "the biggest long-term threat in the Pacific region". Taking that longer-term view, it is fair to conclude that climate change, if not adequately mitigated, will become the greatest threat to national security for Australia, for the United States, and for many nations around the globe, and not just in the Pacific. Climate change today is an existential threat to some nations, particularly small, low-lying island states.

Climate change now requires the full attention of government, and across all relevant government departments. The Paris climate agreement has the goal of limiting warming to 1.5–2°C. Yet one of America's most eminent scientist and the former head of NASA Goddard Institute for Space Studies, James Hansen, in new research released on 18 July[4], shows that "a long-term global average temperature of 2°C – or even of 1.5°C – could spur 'slow' climate feedbacks. In particular, it could lead to partial melting of the ice sheets, which would result in a significant increase in sea-level rise [of 6–9 metres] as happened in the Eemian", 120,000 years ago.

We are now, truly, at a point where the decisions we make will determine the future of human civilisation, and recognizing climate change as a direct threat to the national security of Australia is a starting point to developing a full range of integrated policy responses.

RECOMMENDATIONS

In response to your terms of reference, I make the following recommendations:

(a) the threats and long-term risks posed by climate change to national security and international security, including those canvassed in the National Security Implications of Climate-Related Risks and a Changing Climate Report by the United States Department of Defense;

> Recommendation: Recognise climate change as a global existential risk, and a direct threat to the national security of Australia, and direct the Australian Department of Defence to report regularly on vulnerabilities to military installations, and combatant commander requirements, across the full spectrum of planning and operations.

(b) the role of both humanitarian and military response in addressing climate change and the means by which these responses are implemented;
and

[4] http://csas.ei.columbia.edu/2017/07/18/young-peoples-burden-requirement-of-negative-co2-emissions/

(c) the capacity and preparedness of Australia's relevant national security agencies to respond to climate change risks in our region;

Recommendation: Make climate-fragility risks a central foreign policy priority by integrating climate-fragility responses into planning, implementation, and evaluation processes across Australian Government departments, recognising that this requires new capacities within departments and new cross-sectoral policy processes, and direct the government to report regularly on the development of climate-strategic evaluation capacity, and policy and process integration.

Recommendation: Incorporate climate change and security risk awareness, analysis and response into Australia's mil-mil and civ-mil engagement with partner nations: initiate dialogue, establish and expand links with critical stakeholders, and build an international community of practice around addressing climate security risks. This should include but not be limited to engagement around Disaster Risk Reduction and Humanitarian Assistance and Disaster Response, as many nations primarily understand the security risks of climate change in terms of short-term crises and impacts on infrastructure, failing to appreciate the high probability, high-impact threats that climate change poses to national and international security.

Recommendation: Australia join a global effort to improve capacity to predict the likely locations of violent disruptions fueled in part by the consequences of climate change, including by increasing funding for key Australian institutions including CSIRO, the Bureau of Meteorology and the university sector to enable better understanding of changing climate dynamics.

(d) the role of Australia's overseas development assistance in climate change mitigation and adaptation more broadly;

Recommendation: Recognising that strengthening the resilience of vulnerable nations to the climate impacts already locked into the system is critical, but this will only reduce long-term risk if improvements in resilience are accompanied by strong actionable agreements to stabilise the climate, Australia:

- ensure that its commitments to the Green Climate Fund are fully funded, and that additional measures are taken to support resilience-building in vulnerable nations, especially in the Asia-Pacific region;
- Urgently review, and urge key global partners to review, Intended Nationally Determined Contributions to bridge the gap between the Paris climate agreement's goals and practical outcomes.

(e) the role of climate mitigation policies in reducing national security risks;

Recommendation: Make infrastructure investments that protect coastal communities. Any national infrastructure initiative should prioritize funding for projects that boost coastal resilience.

New coastal infrastructure projects should build resilience into all aspects of design and engineering. This is critical for projects such as ports, roads, bridges, power grids, and wastewater treatment plants, among others.