

Climate Risks Around Australia

What the latest report of the Intergovernmental Panel on Climate Change means for Australians

March 2014

On 31 March, the Intergovernmental Panel on Climate Change (IPCC) releases the Fifth Assessment Report of Working Group II. The report assesses the impacts of climate change and looks at where adaptive strategies are needed around the world to minimise the costs to society. This brief outlines some of the likely consequences projected for Australia from unchecked climate change and highlights how, in contrast to governments elsewhere and some Australian municipalities, state and federal governments often seem in retreat from good risk management. Despite the overwhelming case for adaptation, many in government, as well business, are walking backwards into the 21st century, presuming the future climate will be like the past or that adapting to a world warmed by 2°C, 3°C, and 4°C will be straightforward and simple.

What is the IPCC Working Group II report about?

This upcoming report by Working Group II is on *Impacts, Adaptation, and Vulnerability*. In other words, it looks at the consequences of the physical impacts of climate change for society, the economy, and nature. The report will include sections on each global region, including Australia.

Working Group II is made up of experts on society, economics, risk management, security, health and disease, food and agriculture, water and other natural resources, and ecosystems and wildlife.

The new report builds on IPCC work released in September 2013, which provided an update on the latest around the science on how the climate has changed, what is driving this change and what influence human activities will have on the climate system in the future (see our Media Brief and other work on this [here](#)).

What is Working Group II likely to say?

The table at the end of this brief gives examples of observed and predicted impacts and risks associated with climate change across Australia. Key messages on global risks and impacts will likely include:

- **Climate change threatens agriculture globally.** The impact of climate change on global agriculture has been and will continue to be overwhelmingly negative. Despite a few benefits, scientists are confident that the risks are much greater than the opportunities, especially if warming continues unabated. More and more intense extreme events leads to greater uncertainty and insecurity for farmers, disruptions to the food supply, and sustained higher and more volatile food prices for consumers.
- **Coastal systems and low-lying areas are under threat.** Sea level rise and coastal flooding will impact hundreds of millions of people globally. Regions particularly vulnerable include Australia's neighbours in the Pacific, South-east Asia, East Asia and South Asia.
- **Human health is being put at risk.** Climate change will lead to illness and death from extreme climate events like more intense and frequent heat waves and fires. It will also increase the risks of food and water-borne diseases and impacts on agriculture will exacerbate malnutrition, particularly in children. Drought and changes in rainfall are expected to significantly reduce water security in many, particularly sub-tropical, regions.
- **Climate change multiplies security risks.** Defence experts— including senior military officers in the United States, the United Kingdom, and NATO—are increasingly worried about how climate change and multiply the threats to security and stability. Rising temperatures, sea-level rise, changes in rainfall, food insecurity, the spread of infectious diseases, and population displacement can mix with ethnic, economic, and political tensions to catalyse conflict.
- **Climate change will exceed the ability of many natural environments to adapt:** Coral reef and alpine ecosystems are particularly vulnerable to climate change, but many others will be degraded too. Many impacts will be irreversible with local and global species extinctions likely.

Are governments failing to adapt to climate change, putting Australians at risk?

Climate change is and will continue to increase the frequency and severity of many kinds of extreme weather, including heavy downpours and flooding, heat waves, fire weather and droughts, and intense storm surges.

We are already committed to some warming, so adaptation is essential, but urgent action is needed to avoid dangerous warming of 2°C or more—beyond which adaptation become increasingly more costly and in many cases impossible. Even with the unprecedented level of action that is occurring to limit pollution and drive renewable energy investments the world is currently on track to 4°C warming or more. This is the potential world we must be prepared for.

In Australia, investment in adaptation is uneven, at best. Current efforts are weak, poorly co-ordinated, and piecemeal, where they exist at all.

Positively, the Commonwealth Department of the Environment is preparing a new national adaptation assessment framework against which to measure Australia's progress in adapting to climate change and the country's resilience to its impacts. However, the previous 2007 Framework, agreed to by the Council of Australian Governments, was poorly followed through. The Climate Institute's *Coming Ready or Not* report examined the exposure of our infrastructure to climate risks. It found that only the water sector was relatively well advanced in adjusting to projected climate change impacts. However, even this is being overwhelmed by poor government policies and a lack of business preparedness, raising climate risks to communities and infrastructure.

For example, the IPCC predicts a sea-level rise of up to 1.1 metres by 2100—a projection widely regarded as conservative. For Australia, this means at least 14,800 commercial and industrial buildings, and as much as 35,000 km of road and rail are at risk of inundation and storm damage. Transport and building assets, today worth \$226 billion, are exposed to consequences of this sea-level rise. However, policy to manage this risk to coastal assets is inconsistent and inadequate.

New South Wales and Queensland have withdrawn planning policy tools to help local councils manage these risks to coastal development. To illustrate, New South Wales has removed projected climate-risk warnings from mandatory disclosures when buying a property. This increases the exposure of communities to storm surges and sea-level rise.

Also, Infrastructure Australia (IA) is legally required to report to the Federal Government on how climate change would affect infrastructure policy. IA was set up to assess infrastructure investments on their productivity. The Garnaut Review conservatively estimated climate costs to Australian infrastructure alone would be worth \$9 billion annually by 2020, it makes sense for our independent infrastructure advisory body think about how to minimize risks.

The Commonwealth Government is proposing to remove IA's climate risk reporting mandate. This is despite the Infrastructure Coordinator's warning that rising sea levels and heat stress are among the climate impacts threatening "a significant proportion of Australia's existing infrastructure assets ... and adaptation will require changes to the scope and mix of infrastructure investment".

Other countries provide examples of how to do it better:

- + In the UK, the government has already carried out a nationwide climate risk assessment and requires organisations responsible for essential services and infrastructure to report on the current and predicted impacts of climate change, and how they propose to manage the associated risks.
- + In the US, every federal agency is required, by Presidential order, to study their climate risks and vulnerabilities, and to draw up plans for managing risks—short- and long-term. Recently, President Obama requested US\$1 billion for a climate resilience fund to help prepare vulnerable communities for more frequent and more intense extreme weather events. Also, the 2014 US *Quadrennial Defense Review* identified climate change as a clear risk to global security, with implications for how the American military operates and for its long-term strategy.

At a more local level, in the wake of Hurricane Sandy, the Mayor of New York City last year unveiled a US\$19.5 billion climate change adaptation plan, including more than 250 initiatives to reduce the vulnerability of the city to flooding and storms. Many other cities, including London, Quito, Durban, and Rotterdam have or are developing climate change adaptation plans, while Melbourne and Geelong are internationally recognized leaders.

In stark contrast to State and Federal governments, the insurance sector is beginning to price in climate risk, and skyrocketing premiums and uninsurability may well emerge as a key driver of adaptation. Already, household insurance premiums are rising and policies are changing in parts of the country exposed to extreme weather. Australia makes up less than 2 per cent of the global reinsurance market but over 6 per cent of losses in the five years to 2013, according to the Insurance Council of Australia.

What should governments be doing?

- Avoid unmanageable risks of climate change by working with the international community to keep global warming below 2°C above the pre-industrial average. This includes having policies that can reduce the nation's carbon pollution by 25 per cent on 2000 levels by 2020 and around 60 per cent by 2030.
- Manage the unavoidable risks of climate change by:
 - Integrate climate change risks associated with 2- and 4-degree climate change scenarios into all appropriate national policies, standards, targets and oversight (e.g. health policy, natural disaster responses, defence).
 - Require private-sector proponents or owners of infrastructure—especially those seeking Commonwealth approval or funding—to disclose how their assets and interdependencies will manage climate risks under 2 and 4 degrees of warming.
 - Establish the Commonwealth as a leader in climate risk management, in particular by requiring all relevant federal agencies to publish reports on their climate risk readiness for 2- and 4-degree warming scenarios. The Commonwealth should also lead collaboration, across jurisdictions, to develop agreed approaches to adaptation, including standards and guidelines in planning, developments, and approvals.

What are the likely risks and impacts of climate change in Australia?

The impacts of climate change can already be seen in Australia now, and are clearer and more pronounced than when the last IPCC Assessment Report was released in 2007.

Currently, emissions have the world heading to 4°C or more above the pre-industrial temperature. Australia and the world risk missing the chance to keep warming to 1.5°C.

The following tables give examples¹ of observed and predicted impacts and risks associated with climate change across Australia. These points are drawn from assessments and studies by CSIRO, the Climate Commission, the Bureau of Meteorology, the Garnaut Review, and previous IPCC reports on impacts.

Changes to date (i.e. <1°C)	<ul style="list-style-type: none">• Rainfall has declined since 1970 in the southwest, mostly in winter, and in the southeast since 1990, mostly in autumn and early winter. The northwest of the country is becoming wetter, on average.• Every decade since the 1970s has been warmer, on average, than the last. January 2013 was the hottest month January on record in the hottest summer on record.• The duration and frequency of heatwaves have increased, with the hottest days becoming hotter.• In the decade to 2011, the number of record-high temperatures exceeded record lows by as much five to one.• The risk of extreme fire weather has risen across large parts of the country since the 1970s.• In southeast Australia, there has been an extension of the fire season into November and March, with the majority of the most intense fire seasons have occurred from the 1990s.• The extent and frequency of exceptionally hot years and drought is rising.• Observed decline in snow cover.• The Great Barrier Reef has lost half its coral cover in the last 27 years. The loss was due to storm damage (48 per cent), crown of thorns starfish (42 per cent), and high temperatures (10 per cent).• The world's oceans have become almost 30 per cent more acidic, on average.• The average global sea level rose by more than 0.2 metres between 1880 and 2000 and is rising still.• Many communities already show signs of vulnerability to extreme weather events, e.g. The 2009 Victorian heat wave and fires, widespread drought, and heavy flooding in Eastern Australia.• Property insurance premiums rise dramatically in exposed parts of the country, with some policies making it difficult or even impossible to insure against extreme weather events.
1–2°C	<ul style="list-style-type: none">• By 2020, very extreme bushfire days are projected to occur twice as often in southeastern Australia, and catastrophic fires could occur twice as often.• Rise in mental and physical health costs associated with extreme events.• Significant loss of species, as adaptive capacity of wildlife is exceeded.• Loss of some coastal developments because of increased erosion and storm surges where sea defences are absent.

¹ While this media brief uses the best available scientific reports, it will be reviewed and revised once the latest IPCC report is publicly available. Note that impacts and risks listed are not exhaustive and are matched *indicatively* with temperature rises above the pre-industrial average.

	<ul style="list-style-type: none"> • Wheat yields may increase but nutritional quality is likely to be compromised by elevated atmospheric CO₂ levels. • Areas with annual average snow cover of 30 days per year could decline by 14–54 per cent. • Around 2,000 more heat-related deaths a year, on average. • The sea level around Kakadu National Park likely to rise by 8–30 cm by 2030, with severe impacts on the wetland ecosystem, together with its tourism and cultural values. • Increased demand for aid and disaster response. Rising sea levels displace citizens of low-lying small Pacific Island states. • Changes to many ecological communities around Australia. • Tropical cyclones are expected to increase in intensity with continued warming but remain the same or decrease in numbers making landfall.
<p>2–3°C</p>	<ul style="list-style-type: none"> • By 2050, very extreme bushfire days are projected to occur four to five times as often in southeastern Australia. • Without adaptive measures, Australia is projected to become a net importer of wheat by 2050. The gradual decline and constant disruptions to primary production in Australia has grave consequences for regional and global food security. • By 2050, a 44 per cent reduction in suitable area for wine grape production expected. • Average runoff in southeastern Australia could decline by as much as 40 per cent. • Irrigated agriculture in the Murray–Darling Basin expected to fall by 12–49 per cent. • As much as 60 per cent of the Great Barrier Reef experiences regular bleaching due to high temperatures. • Further decreases in average rainfall are expected over southern Australia compared with the climate of 1980 to 1999: a decrease of up to 30 per cent by 2070 for high emissions, with largest declines in winter and spring. • A sea-level rise of 0.5 metres can lead to an increase in the frequency of coastal flooding by between one in 100 and one in 1,000. A 100-fold increase means a one-in-100-year storm surge would occur, on average, once a year. • Tropical cyclones are expected to become more intense, but are unlikely to increase overall number. • Southward spread of risk from tropical insect-borne diseases, e.g. Dengue Fever.
<p>Greater than 3°C</p>	<ul style="list-style-type: none"> • What are today normal activities, like growing food or working outdoors, become impossible in many regions, with consequences for health and productivity. The Australian way of life, including outdoor sporting and recreational activities, become impossible. • Dangerous water shortages widespread in urban and rural areas. • Run-off in the Murray–Darling Basin is likely to decline with further warming, such that irrigated agriculture is projected to decline by 90 per cent by 2100. • Heat-related deaths are projected to rise by around 10,000 by 2100. • The 2007 IPCC report predicted a sea-level rise of up to 0.8 metres by 2100, <i>but this is now thought to be an underestimate.</i> • A more acidic ocean impairs reproduction and development of many marine organisms and disrupting seafood chains. Warming of the waters accelerates this process. • A sea-level rise of 1.1 metres, projected for 2100, puts at risk as many as 14,800 commercial and industrial buildings, and as much as 35,000 km of road and rail. • \$226 billion in transport and building assets exposed to consequences of sea-level rise. • Areas with annual average snow cover of 30 days per year could decline by 30–100 per cent. • Massive and widespread loss of species. More than 50 per cent of habitat of Eucalypt species likely to be lost Australia-wide. • The Great Barrier Reef, no longer dominated by corals or possess the range of marine wildlife seen today, is destroyed, along with its tourism, fishing, and cultural values. • Increased expenditure on aid and welfare required as communities, at home and abroad, require more support, with some facing breakdown. • Around the world, hundreds of millions of people face displacement, putting pressure on Australia’s and regional security. Major dislocation of population from Asian megacities, with consequences for regional security and stability.

For any further information on the IPCC and its processes and findings, please read our [FAQ](#).

For more information

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