

SUBMISSION TO SENATE INQUIRY: Recent trends in and preparedness for extreme weather

Background

Townsville is the largest city in North Queensland and, in terms of population, is one of the fastest growing cities in the state. As at 30 June 2011, the estimate resident population of Townsville City was 180,389 persons. The local government area covers 3,736 square kilometres and is currently experiencing continued rapid residential development.

Townsville experiences a dry tropical climate, with lower rainfall than elsewhere in the tropics. Average annual rainfall is 1143mm, on an average of 91 rain days, which mainly falls in the wet season between November and April.

The region is characterised by low lying coastal plains with a number of rivers, creeks and freshwater wetlands with hills and mountains rising out of the plain. The long coastline features beaches, mangrove estuaries, saltpans and coastal swamps. Townsville has a strong and diverse economy in which significant industries include retail trade, health and education services, government administration and defence, construction, mining, manufacturing, and property and business services. Together, Queensland Rail and the Port of Townsville provide a transport hub for the region's mining and agricultural industries, as well as for locally-based Xstrata Copper Refinery, Sun Metals Zinc Refinery, Queensland Nickel and the Queensland Sugar Corporation Distribution Centre.

Townsville city is a major service centre and the main centre for government administration outside Brisbane. Regional health services are provided by the Townsville Hospital. There are a number of research institutions such as James Cook University, the Australian Institute of Marine Science, the Great Barrier Reef Marine Park Authority, Department of Primary Industries and CSIRO. The large defence presence due to the army and air force bases also influences the local economy.

There have been over thirty-five weather related events that have affected the Townsville City Council area since 1970. Twenty-five of these were related to cyclones affecting North Queensland and Townsville during the northern 'wet season' – December to April. Only one of these – Cyclone Althea in 1971 – directly impacted on the local community although Cyclone Yasi Feb 2011, which crossed the North Queensland coast approx. 250km north of Townsville, was large enough

to cause major disruption to transport and power infrastructure for over a week after the event. Total estimated damage to the North Queensland area for Cyclone Yasi including Townsville was \$800m. The Natural Disaster Relief and Recovery Arrangements (NDRRA) claim for repairs in Townsville and the immediate surrounding area is \$224.5m.

The Insurance Council of Australia estimated the damage in the surrounding area as \$19m for Cyclone Charlotte (which weakened to a rain depression before reaching Townsville) in Jan 2009 and \$71m for the flooding event associated with Cyclone Sid in January 1998.

Terms of Reference for Inquiry

1. Recent trends on the frequency of extreme weather events.....

Locally, there have been no noticeable alterations to trends of extreme weather events.

2. Based on global warming scenarios outlined by the Intergovernmental Panel on Climate Change.....

(i) Projections on the frequency of extreme weather events

Best estimates are that by 2030 Australia will face:

- a further 1 degree Celsius of warming in temperatures;
- up to 20 per cent more months of drought;
- up to 25 per cent increase in days of very high or extreme fire danger;
- increases in storm surges and severe weather events.

Extreme events

Tropical cyclones are highly variable in terms of their frequency and intensity. Projections indicate there may be an increase in the proportion of tropical cyclones in the more intense categories (3-5), however a decrease in the total number of cyclones. By 2030, projections show that there may be a 60 per cent increase in severe storm intensity and a 140 per cent increase by 2070.

Extreme **rainfall intensity** is also projected to increase, indicating that despite projections showing that total rainfall across most of Queensland will remain stable or decrease, the projected increase in rainfall intensity could result in more flooding events.

The population of Queensland is susceptible to **heat-related deaths**. Without mitigation, climate change is projected to cause an increase in the number of days in Brisbane above 35°C from 1 per year to up to 21 per year by 2070.

Mosquito-borne diseases, such as dengue (a current issue in North Queensland and Townsville) can lead to serious and sometimes life-threatening illnesses. Under moderately warmer and wetter climate conditions, there may be an increase in the prevalence of some mosquito-borne diseases in some parts of Queensland.

Recent seasons of above average rainfall followed by extended periods of little or no rain have produced the present **bushfire** situation throughout Australia. The 2012 bushfire season in Townsville and North Queensland area has been similar to that experienced in other parts of Australia

(ii) Costs of extreme weather events and impacts on.....

Major repairs and reconstruction works have been undertaken by Council to repair infrastructure damage from disaster events in recent year. The cost to 'Government' for this continues to escalate.

(iii) Availability and affordability of private insurance, impacts on availability and affordability

Trends in increasing insurance premiums and/or reluctance by insurance companies to now offer home and contents cover for flood and cyclone events is prevalent in North Queensland. Increases of \$1,000+ per yearly renewals seems to be the norm. Increased insurance premiums is placing a road block to people taking out insurance. Less people being insured leads to increased insurance fees.

In this northern area, the public are becoming very vocal about the increase in insurance premiums. The option of under insuring of private properties will indirectly lead to increased government costs for future events.

Government 'hand outs' immediately after disaster events is becoming the norm and does not assist in the development of a resilient community.

3. ***Preparedness of key sectors for extreme weather events***

Modern society and infrastructure relies on electronic communications and power supply to maintain services. Damage to aerial power and communications infrastructure will always delay communities in returning a community to some form of normality after a disaster event.

Transport routes are essential for continued supply of goods, food and equipment for all communities. Disaster events regularly disrupt this supply route and place an added strain on the response and recovery processes. Continual funding of upgrades and flood proofing the national highway, major State controlled roads and the rail system will lessen the period communities may be isolated.

The disaster management process is well exercised and coordinated in our local area with clear delineation of roles and responsibilities between agencies and respective levels of government. This process is usually activated each year for an event – one of the issues of living in a tropical environment. This relationship has been generated by extensive networking, training and exercising over many years and is invaluable during a disaster. The current ongoing review and reorganisation of State Government Departments is disrupting this network and processes with relationships to be re-established once the restructure of government agencies is completed.

4. ***Preparedness and adequacy of resources in emergency services sector***

The Queensland Disaster Management Arrangements are fully understood and enacted within the Townsville area. Under this process, support from outside the local area is, and previously been, arranged with few problems.

While the levels of coordination are detailed, their interpretation and implementation at the local level considering local issues, allows the system to function when required.

5. *Effectiveness of division of responsibilities between different levels of government...; any gaps in Climate Change Adaptation Framework.....*

When the Queensland Disaster Management Arrangements are allowed to function with limited political or State DMG (Brisbane based) interference, the local Disaster Management processes can adequately support the local community. Additional resources annually to test these arrangements will continually improve local disaster management processes.

Success of this tiered structure rests with every player being aware of what they can and should do. This leads to ensuring that all players in the disaster management game are adequately trained, well before any event.

In December 2011, Council submitted Recommendations on the Climate Change Adaption Framework to the Australian Government (**Attachment 1**). Many of these recommendations address items being raised in this current Senate Inquiry and are considered to be relevant.

For further information on this submission, please contact the undersigned.

Ray Burton
Chief Executive Officer

17 January 2013



SUMMARY OF COUNCIL RECOMMENDATIONS TO THE AUSTRALIAN GOVERNMENT

The Council believes early action is needed to manage the climate adaptation challenge. We have engaged with a range of stakeholders over two years and commissioned studies to inform our advice. The areas for action summarised below seek to address current barriers to adaptation and help build capacity to manage coastal climate risks more effectively.

1) Climate risk protection standard to guide planning and investment

- Develop a coastal risk based standard to guide developers and asset managers on managing climate change risk, where Australian Government investment and funding is involved.
- Progress a national approach to the development and application of the coastal risk based standard for major investment decisions with states and local government.
- Conduct a five yearly national audit to assess how climate change risks are being incorporated in major investment decisions in order to minimise future risk.

2) Improving decision making through better science and information

- Establish a collaborative work program with states and local government to develop and deliver access to the best available evidence on coastal climate change risk and sea level rise, involving two elements:
 - ready access to nationally consistent and scientifically based information on physical effects of climate change to support government decision making.
 - regional modelling approaches and nationally consistent hazard assessment methodology to inform coastal management planning.

3) Coastal policy and regulatory reform

- Facilitate implementation of a regulatory reform agenda, in partnership with states and local government, to address existing barriers to adaptation (risk disclosure, building codes, existing use rights, legal liability).
- Further explore key emerging issues such as the use of the public trust doctrine to balance public interests and property holders' rights.

4) On ground adaptation - tackling hotspots

- ☐ • Develop assessment criteria to identify nationally significant hotspots where early coastal adaptation action (across governments) is warranted.
- ☐ • Broker government and private sector partnerships to commence on ground adaptation planning in nominated hotspots.

5) Integrating climate change into national agendas

- Strengthen the focus on coastal climate change adaptation in three key areas:
 - the national urban and regional policy agenda
 - insurance and banking sector reform
 - managing natural disaster risk (planning and response).

Council advice to Minister Combet – December 2011

Even with concerted global action to reduce greenhouse gas emissions, the science tells us sea levels will continue to rise for centuries to come. This will have implications for Australia and our coastal society. Rising sea levels will expose homes, infrastructure and beaches to inundation, erosion and saltwater intrusion (saline water and higher corrosion rates). Low lying settlements around estuaries, lakes and rivers will also be vulnerable.

Managing climate change risk, or the consequences of climate change, is made more complex with the need to accommodate a growing population without putting people in harm's way or increasing national levels of financial risk.

The Council believes early action is needed to manage the climate adaptation challenge. It will take time to identify and consider options to reduce the vulnerability of our major cities, to remove people from harm's way in high risk settlements and to ensure major infrastructure can continue to deliver the services that underpin our wellbeing and productivity.

It will be more cost effective if we have the opportunity to avoid risk or spread the cost over longer timeframes and ensure large scale, longer term risks are systematically integrated into planning processes.

The Council has engaged with a range of stakeholders over the last year. We have talked to planners, the banking and insurance sectors, valuers and the property industry, local government, and legal and engineering experts. We have also benefited from two legal studies that assessed current regulatory responses to coastal climate change risk and the issue of local government liability.

This advice seeks to address key barriers and build capacity to manage climate risks more effectively. As identified in the House of Representatives Standing Committee report *Managing our Coastal Zone in a Changing Climate, the time to act is now* (2009) the Council believes Australian Government leadership is fundamental to drive coordinated action. Recommendations are made in five areas that would benefit from action now:

1. National coastal climate risk standard to guide planning and investment
2. Improving decision making through better science and information
3. Coastal policy and regulatory reform
4. On ground adaptation - tackling hotspots of extreme risk
5. Integrating climate change into national agendas.

(1) Climate risk protection standard for coastal planning and investment

Decision makers are faced with questions about 'what should get built where and for how long' in areas that have little or no risk now but are likely to have significantly increased risk into the future.

There is considerable confusion amongst coastal decision makers about the appropriate level of risk management that should be adopted now to ensure valued natural and built assets are protected into the future. For example current planning seeks to limit development in high risk storm surge areas (eg the 1 in 100 year storm) or where there are known erosion risks. With climate change, decision makers are asking what level of risk protection is appropriate, and where and when it should be applied. There is also a preference at local government level for greater national consistency across risk protection measures.

While jurisdictions have started to address the issue of coastal risk and climate change for new developments there are gaps and inconsistencies in how policies are applied on the ground. For example not all states have sea level rise planning benchmarks.

Where sea level rise policies do exist, a key issue in on-ground implementation is how to deal with the uncertainty around how quickly sea levels may rise (the rate of change) and how to manage the changing nature of the risk as sea levels will continuously rise over coming decades and even centuries. Decisions about short lived assets such as a utility block will not need to consider a 100 year timeframe and 80cm sea level rise, although decisions about new residential settlement areas should consider that longer term risk.

It is evident that there is still incomplete consideration of future coastal risks in current planning decisions. For example, an expansion of a health facility in Busselton, WA, valued at over \$100 million, is currently planned to be built 100m from the beach. The site is likely to be at risk from erosion under a climate change scenario, with access roads vulnerable to flooding in a big storm/rainfall event and little consideration of emergency access.

The Australian Government has a vested interest in minimising climate risk for its own assets and investments. It also faces increasing liability in its role as insurer of last resort.

Consistent with preliminary advice provided this year, the Council recommends the Australian Government develop a best practice, risk based approach to manage climate risk for Commonwealth assets and investments, and as a condition of Australian Government funding. This guidance could also inform state and local government approaches. The *National Green Leasing Policy* provides a useful model: it sets targets and legal requirements to encourage a nationally consistent effort by state and territory governments to reduce the environmental impact of leased office buildings.

The Council recommends that the Australian Government:

- Develop a coastal risk based standard to guide developers and asset managers on managing climate change risk, where Australian Government investment and funding is involved.

- Progress a national approach to the development and application of the coastal risk based standard for major investment decisions with states and local government.
- Conduct a five yearly national audit to assess how climate change risks are being incorporated in major investment decisions in order to minimise future risk.

(2) Science and information for decision makers

Easily accessible, high quality information that can support good planning decisions is often not available to coastal decision makers. The need for such information has been consistently raised through the House of Representatives report (2009), the national coastal forum (2010) and most recently through the Baker & McKenzie legal liability study (2011).

Council's engagement with stakeholders has identified three areas of need:

i. Scientifically based information to support sound decision making

Local government and professional stakeholders have uncertainty about what constitutes robust, fit-for-purpose science and information. Many of these decision makers have no climate science expertise in house and are seeking access to a reliable and robust source of science to underpin decisions. Information is commonly sought on regional sea level rise projections, extreme sea level events and potential rates of erosion. Having access to reliable and robust information would improve confidence in decision making, reduce future liability and, most importantly, improve decisions and prevent future harm.

The Council welcomes the Government's recent commitment to provide centralised access to consistent flood modelling data in response to the Trowbridge Natural Disaster Insurance Review.

ii. Guidance on integrating climate change into hazard modelling

Understanding the impacts of rising sea levels is a relatively new focus of hazard and risk assessment modelling. It brings with it new challenges. Improved modelling approaches will be required to understand:

- the likelihood of accelerated erosion for many beaches around Australia over the longer term; the switch from generally stable or accreting beaches (gaining sand) to a receding coastline is acknowledged as a key threshold question for coastal management and is not well understood¹.
- the combined impact of erosion and flooding; to date, modelling of sea level rise impacts has tended to assess erosion and flooding impacts separately, whereas in reality these will occur simultaneously.

¹ Chapter 2 - *Climate Change Risks to Australia's Coast: A first pass national assessment* (2009), DCCEE

- how estuaries will respond to/be reshaped by rising sea levels; some estuaries may draw in more sediment and surrounding coastal areas will lose access to that sediment and recede. While other estuaries may deepen, which will change tidal flows into the estuary and up rivers, and potentially the area at risk of inundation.
- what the potential risk is from a combined storm surge and coincident catchment flooding event, especially for areas that are close to the coast and have a major river drainage outlet.

Collaboration with states and local government is required to address modelling and information provision needs. It would minimise duplication and make the most of very limited funding and research capacity in Australia. It may also help in fostering greater consistency in how information supports decision making.

iii. Reducing the uncertainty of Australian climate change projections of sea level rise

Given the focus of Australian settlements along the coast and the complex interaction of different oceans around the Australian coastline, it is important we understand the regional variation in sea level rise projections. Council supports long term investment in the science of sea level rise to ensure the best physical science is available to support government policy. This should be given priority in the implementation of the Australian Climate Change Science program.

The Council recommends that the Australian Government:

- Establish a collaborative work program with states and local government to develop and deliver access to the best available evidence on coastal climate change risk and sea level rise, involving two elements:
 - ready access to nationally consistent and scientifically based information on physical effects of climate change to support government decision making.
 - regional modelling approaches and nationally consistent hazard assessment methodology to inform coastal management planning.

(3) Coastal policy and regulatory reform

Earlier advice to you in October identified some of the barriers impeding coastal adaptation and practices in jurisdictions that could be more broadly applied to improve decision making and make risks more transparent to property holders. These include:

- i. *Risk disclosure:* In most areas of Australia, information on climate risks such as inundation or coastal erosion due to sea level rise is not available for specific properties. This prevents individuals and the private sector from making investment decisions that reflect future climate risk and may also be a factor in legal challenges to planning decisions. Currently, NSW is the only state where local councils are required to disclose coastal hazard risk on planning certificates. A national approach to improve the transparency of climate risk would enable individuals and private sector interests to better account for those risks in valuing market goods.

- ii. *Building codes*: The Building Code of Australia provides guidance on design, materials and construction for building across the range of Australian climates. The Building Code will play a key role in determining whether houses built now are adapted to the future impacts of climate change. The current focus of the Building Code is on predictable forms of risk and does not yet incorporate guidance on how to manage the uncertainty surrounding climate change.
- iii. *Existing use rights/injurious affection*: The legal concept of 'existing use rights' protects current land use from any new restrictions and limits the ability of governments to re-zone land to restrict the intensity of development in areas at future risk. In some states, new development may also be protected through rights to claim compensation if a planning scheme is amended that diminishes development rights (injurious affection). These legal provisions pose a significant barrier to adaptation.
- iv. *Liability for local government*: Legal liability was identified as a key issue in the parliamentary committee report *Managing our Coastal Zone in a Changing Climate*. Many local governments are concerned about liability if they approve a development that is likely to be exposed to inundation from future sea level rise. NSW legislation offers a model to indemnify local government decisions providing they are based on the best available scientific information at that time. Lack of certainty about liability results in decisions being referred and tested in the courts and can impose a significant burden on local government budgets with complex lawsuits extending to hundreds of thousands of dollars.

More broadly, the Council believes further investigation is needed on how to balance the rights of public vs private interests. Shoreline positions will change and there will be increasing inundation of low-lying areas and assets, creating conflict between public rights and property holders' interests. This is an emerging issue which is likely to have a significant national impact. There is currently greater emphasis in law on protecting development and property interests than public amenity such as beach access. Legal conflicts have already emerged and will undoubtedly grow. Where the law currently assumes little or no significant change to property boundaries and entitlements, and does not recognise public rights and the transient nature of land, there is potential for compensation claims to emerge. There is an opportunity to review approaches internationally such as the use of the public trust doctrine in the US.

The Council notes the Productivity Commission inquiry, *Regulatory and policy barriers to effective climate change adaptation*, is underway and is likely to provide further consideration of these issues.

The Council recommends that the Australian Government:

- Facilitate implementation of a regulatory reform agenda, in partnership with states and local government, to address existing barriers to adaptation (risk disclosure, building codes, existing use rights, legal liability).
- Further explore key emerging issues such as the use of the public trust doctrine to balance public interests and property holders' rights.

(4) On ground adaptation action – tackling hotspots

Nearly all of our capital cities are located on the coast. Some cities, such as Brisbane, already have a large exposure to extreme events. Other cities have vulnerable locations around major ports and industry such as Botany Bay and Port Phillip Bay. These areas have high value commercial, residential and industrial assets, which suggests that protective measures are likely to be feasible and cost effective, in the same way that the Thames Barrage in the UK protects the city of London. Early planning to develop climate change adaptation strategies will enable the myriad of small incremental decisions to be made in a manner and timing that is consistent with longer term strategies for protective works and ensure new residential developments are not located in areas that will become high risk.

Thinking ahead for large scale adaptation requires a collaborative multi-decadal approach, with engagement across governments and the private sector. A small number of nationally significant hotspots need to be systematically identified through agreed criteria, and partnerships brokered and commenced in forward scenario planning. This is likely to include major cities, particularly those with foreshore frontage such as Brisbane, Botany Bay and Port Phillip Bay - areas with major infrastructure of national importance.

The Council recommends that the Australian Government:

- Develop assessment criteria to identify nationally significant hotspots where early coastal adaptation action (across governments) is warranted.
- Broker government and private sector partnerships to commence on ground adaptation planning in nominated hotspots.

(5) Integrating climate change into national agendas

There is an opportunity for the Government to ensure coastal climate change risk is strongly considered through a number of COAG or interjurisdictional agenda initiatives currently underway. These include:

- i. *Urban planning*: National criteria were developed to shape capital city planning and ensure cities have long term plans to manage population and economic growth, address climate change, improve housing affordability and tackle urban congestion. The COAG Reform Council will provide a final report to COAG in December 2011 on how well the planning regimes meet criteria. In particular, the *National Urban Policy Framework* identified areas of work that would support cities to become more resilient to climate change risks and reduce the exposure of urban assets to those risks.
- ii. *Insurance*: The floods in the summer of 2010/2011 raised issues about the adequacy of insurance coverage for flood and flood definitions; these were examined in the Trowbridge Review of Natural Disaster Insurance (Treasury). Further consultation is underway on more complex questions, including how best to cover high and extreme flood risk homes in an affordable way (flood reinsurance).

With climate change projected to increase the intensity of extreme events, and as the insurer of last resort, it is in the Government's interest to understand how the risk of inundation will change (both catchment flooding and ocean storm surges) under different climate change scenarios.

The Council recommends that sea inundation and erosion issues be included in the discussion on insurance coverage. Further, the Council advises the Australian Government to consider how best to address the issue of affordable insurance within an adaptation context and constrain future growth in high risk areas. In some instances it may not be feasible to offer affordable insurance and continuing occupation; relocation may be in the long term interest.

- iii. *Natural disaster mitigation:* COAG adopted a *Natural Disaster Resilience Strategy* in February 2011 that places greater emphasis on preparing and planning for natural disasters. There needs to be a stronger recognition of climate change impacts and adaptation in hazard mapping and modelling, and in key emergency management policies, to ensure future risks can be addressed. For example, the Australian Government may need to consider thresholds that might trigger different action under recovery payments (eg no future rebuilding of expensive assets in high risk areas).

The Council recommends that the Australian Government:

- ☐ Strengthen the focus on coastal climate change adaptation in three key areas:
 - the national urban and regional policy agenda
 - insurance and banking sector reform
 - managing natural disaster risk (planning and response).

